The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 132, NO. 7 CHICAGO, ILLINOIS OCTOBER 19, 1946

COPYRIGHT, 1946, BY AMERICAN MEDICAL ASSOCIATION

OPTIMISM IN MEDICINE

Chairman's Address

WILLIAM D. STROUD, M.D.
Philadelphia

This subject has been a fetish with me ever since I started practicing medicine some twenty-six years ago. In fact it was the subject of my address as president of the American Heart Association and I trust I may be forgiven if I repeat, in this paper, some of the observations which I made at that time.

It has seemed to me that more youngsters have been made miserable and parents unhappy through physicians' serious attitudes toward unimportant heart murmurs than such youngsters have been made invalids because of rheumatic heart disease. Certainly there are many murmurs, especially in the pulmonic area, which are absolutely of no importance from the standpoint of circulatory efficiency or length of life. In fact, many children with definite valvular damage live the full span of life and others do not develop circulatory insufficiency until the third, fourth or fifth decade. Certainly their lives can be much happier if their physical activities are unrestricted, and I doubt whether the normal physical activity of childhood plays any part in the progress of the pathologic lesion. It is practically impossible to compromise in these cases. Either these youngsters should be allowed to participate in all the normal activities or else be made almost total invalids. If one restricts a youngster's activity because of a valvular lesion, the parents are constantly unhappy and apprehensive; hence it is almost impossible to restrict a child's activities unless one makes him a total invalid. In summary, then, from the standpoint of murmurs I should like to urge doctors to take an optimistic attitude and permit children to live happy lives rather than prohibit them from carrying on the activities of youth which give so much happiness.

In my opinion too many young girls with valvular heart disease have been advised against marriage because of the strain which pregnancy may place on the heart. Certainly even with aortic insufficiency or mitral insufficiency or both, with only slight cardiac enlargement, most of these women can go through one or two pregnancies satisfactorily.

Of course blood pressure is important, and yet a British physician has suggested that all sphygmomanometers should be thrown out the window since there is little one can do about blood pressure. Fortunately there is little that can be done to raise blood pressure. As a matter of fact, I believe if it is finally recognized by the public that a low blood pressure is a good thing the number of patients visiting general practitioners will be reduced about 50 per cent. Recently a gentleman of 70 years of age, when I reached for my blood pressure apparatus, remarked "That is all a racket. Twenty years ago they started treating me for low blood pressure and for the past ten years they have been treating me for high blood pressure. If the doctors had only let me alone I would have been all right." It is true that in the last few years it has been found that thiocyanate—in those individuals with a normal capillary fragility—can be of benefit and the radical total sympathectomy operation does seem to have been beneficial in a certain number of cases, but I feel that many persons have unnecessarily been made blood pressure conscious with pressures only slightly above normal and that their lives have been unhappy through the constant attention to their blood pressure.

Many physicians have purchased electrocardiographic galvanometers, take tracings routinely and are still unable to interpret such tracings accurately. Although a slightly widened ventricular complex in the electrocardiogram is not normal, yet a majority of patients with such an electrocardiographic finding live the expected span of life. Too many doctors urge patients to give up their employment and become invalids on such minor electrocardiographic findings. In fact, many physicians give these patients copies of their electrocardiograms with a diagnosis of "myocardial degeneration." Such a diagnosis naturally causes a patient to become introspective and apprehensive. A few years ago a patient came to my office and told me that his physician had told him he had "a coroner's occlusion." Such a diagnosis must have caused that man considerable unhappiness. We must be cautious in what we tell patients, especially about the heart. In my opinion no doctor should tell a patient that he has angina pectoris. You ask what we can tell such persons with a typical history of angina of effort? I tell them they do not have angina pectoris but that they have a temporary anoxemia of a portion of their myocardium. This impresses them with my vast knowledge and seems to satisfy most patients and even physicians. Then if one continues to treat them as cases of angina, the ultimate result is just as satisfactory without the constant fear of sudden death, which comes to the mind of the average person who thinks he has angina pectoris.

It is my belief that patients with coronary insufficiency can carry on practically normal lives for many years with the assistance of glyceryl trinitrate used not only during the attacks of pain but prophylactically. Most people with coronary insufficiency know the things that bring on pain, such as walking after meals or in

Read before the Section on Internal Medicine at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 4, 1946.

cold weather against the wind. If it is necessary for these persons to make such effort, it is perfectly possible for them to ward off an attack by dilating the coronary vessels with a tablet of glyceryl trinitrate before making such an effort.

As far as I am able to discover, there is no proof that tobacco causes atherosclerosis or arteriosclerosis. Most people who smoke know whether or not they are sensitive to nicotine. If a man is not sensitive to nicotine, I believe it is perfectly safe for him to smoke. However, sensitive or not, in the presence of angina of effort or a healed coronary occlusion if a person is having substernal pain I believe eliminating tobacco will tend to lessen the frequency of attacks of pain.

As the years go by, I think we all agree we are astounded at how well a majority of patients do who have had a nonfatal coronary occlusion with myocardial infarction. It seems wise never to give a final opinion in such cases from the standpoint of giving up their work, giving up golf or similar activity for many months after the occlusion, since often they find they can carry on a normal life after they have developed an adequate collateral circulation.

Two of the most important forms of treatment in the case of acute myocardial infarction are rest and reassurance. To obtain rest the patient should be allowed to assume the most comfortable position and to turn from one side to the other under most circumstances. From the very beginning the patient should be reassured. The physician should not show his apprehension or permit the nurses or family to show apprehension, even if the situation seems critical, as fear probably accentuates myocardial irritability through the effect of epinephrine, thus increasing the possibility of ventricular fibrillation with sudden death. In most cases it is safe to allow a patient to use a commode with much less strain on the circulation than using a bed pan. I believe I have made more friends as a consultant through urging the family physician to allow such a patient to use a commode than through any other form of advice.

I feel that the average patient with a healed coronary occlusion can return to a sedentary occupation part time in about three months. Although it is debatable, because of the possibility of further occlusions, I believe it is safe to allow such patients to drive a car three months or so after their acute episode. Also if they do not have angina of effort three or four months after their original attack any mild form of exercise such as golf or swimming in warm water seems indicated, if desired. It is my feeling that too many such patients are made total invalids unnecessarily. In fact, it is my experience that after adequate collateral circulation has developed it really doesn't seem to matter what activities these persons carry on within reason from the standpoint of developing further coronary occlusions. Certainly a patient is a happier and more useful member of his community if he can lead an approximately normal life.

Many physicians advise patients with hypertension or coronary artery disease or any form of heart disease not to drink. For myself I see no reason why patients with these conditions should not drink in moderation. Many patients with angina of effort secure as much relief from brandy or whisky as they do from glyceryl trinitrate and I can see no reason why they should be deprived of the pleasure of drinking unless there is some evidence that alcohol is injurious.

1011 Clinton Street.

EXPERIMENTAL HUMAN BACILLARY DYSENTERY

Polyvalent Dysentery Vaccine in Its Prevention

HOWARD J. SHAUGHNESSY, Ph.D.
ROLAND C. OLSSON, M.D.
KENNETH BASS, M.S.
FRANCES FRIEWER
and
SIDNEY O. LEVINSON, M.D.
Chicago

We [6] have previously reported the results of studies in animals and man with single strain and mixed bacillary dysentery vaccines inactivated by exposing continuously flowing thin films of organisms to a powerful source of Schumann ultraviolet for a fraction of a second.[7] These irradiated dysentery vaccines did not cause severe reactions in man even when given in doses of 4.8 billion per injection. They evoked in mice a very significant degree of immunity; in most cases the immunized animals resisted 100,000 or more LD_{50} challenge doses of living organisms. Mouse protective antibodies were also increased significantly in both men and mice. However, in our previous paper we stated that "these results are not direct evidence that the dysentery vaccine is an effective immunizing agent in man. The value of irradiated or any dysentery vaccine can be determined only by a controlled experiment in human volunteers immunized and then tested for resistance to infection by ingestion of living organisms or by very extensive field studies on large groups of individuals who are exposed to the natural infection."

This report deals with a controlled experiment in human volunteers carried out in an isolation ward of the hospital at the Old Prison, Joliet Penitentiary, Joliet, Ill. The plan of the experiment required that the infective dose of dysentery bacilli for man be determined by feeding graded doses of living Shigella to human volunteers. The only previous information concerning the possible susceptibility of man to experimental infection and the possible infective dose rested on a few published observations of accidental laboratory infections.[8] These data indicated that man could be infected with rather large doses of laboratory strains of Shigella but provided no other significant information.

The human volunteers, other than those needed for titrating the infective dose, were divided into three groups of approximately equal size. One group was

From the Division of Laboratories, Illinois Department of Public Health, and the Samuel Deutsch Serum Center, Michael Reese Research Foundation.

Read before the Section on Preventive and Industrial Medicine and Public Health at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 4, 1946.

Owing to lack of space, this article has been abbreviated for publication here. The complete article appears in the authors' reprints, copies of which the authors will be pleased to send on request.

The work described in this paper was done under a contract recommended by the Committee on Medical Research, between the Office of Scientific Research and Development and the Michael Reese Research Foundation.

Aid and encouragement were given the authors in this study by Mr. T. P. Sullivan, director of public safety, state of Illinois, and Dr. Roland R. Cross, director of public health, state of Illinois. Mr. James M. Ragen, warden, Illinois State Penitentiary, and his staff provided facilities, personnel and wholehearted cooperation.

6. Shaughnessy, H. J.; Milzer, Albert; Neal, J., and Levinson, S. O.: Production of Potent Inactivated Vaccines with Ultraviolet Irradiation: IV. Vaccination Against Bacillary Dysentery, J. Infect. Dis. **78:** 69-78 (Jan.-Feb.) 1946.

7. Levinson, S. O.; Milzer, Albert; Shaughnessy, H. J.; Neal, J. L., and Oppenheimer, Franz: A New Method for the Production of Potent Inactivated Vaccines with Ultraviolet Irradiation, J. Immunol. **50:** 317-329 (June) 1945.

8. Wilson, E. S., and Miles, A. A.: Topley and Wilson's Principles of Bacteriology and Immunity, ed. 3, Baltimore, Williams & Wilkins Company, 1946, p. 1574.

immunized with 2.5 cc. of irradiated polyvalent vaccine containing 4.8 billion organisms per cubic centimeter, one with 2.5 cc. heat killed polyvalent vaccine made from a portion of the same bacterial suspension used in making the irradiated vaccine, also containing 4.8 billion organisms per cubic centimeter, and the third group constituted the unvaccinated controls. Inclusion of a group vaccinated with a monovalent Flexner W vaccine was not feasible because of the limited number of volunteers obtainable.

Two weeks after the third injection of vaccine it was planned that the volunteers were to be fed with an amount of sulfadiazine sensitive Shigella paradysenteriae (Flexner W) sufficient to cause definite signs of bacillary dysentery in 50 per cent of the immunized controls. The decision to challenge with a single type of dysentery organisms was forced on us since there was not available to us a sufficient number of volunteers to permit challenging with all the types included in the vaccine without making the groups so small that the results would not withstand critical analysis.

METHODS AND MATERIALS

The strains of Shigella employed in making the vaccine were Shigella paradysenteriae (Flexner V [79-118-3090], Flexner W [79-118-2W], Flexner Z [79-118-5Z] and Boyd 88 [79-118-8B]), all obtained from Dr. A. J. Weil; Shigella sonnei (Cheatam strain) obtained from Dr. Stuart Mudd and Shigella ambigua (I. D. H. strain Schmitz 3396) isolated at the Illinois Department of Public Health Laboratories. All these strains were selected on the basis of mouse virulence and content of somatic antigen. Except for the Cheatam strain of Sh. sonnei these strains were used in making vaccine for our previous experiments. The organisms were grown on the surface of freshly prepared veal infusion agar for twenty-four hours at 37 C. The organisms were then resuspended in isotonic solution of sodium chloride and adjusted to a concentration of 4.8 billion organisms per cubic centimeter by nephelometric standards and plating. The irradiated vaccine was exposed to extreme ultraviolet rays for 0.5 second in the manner described previously.[7] Because of the heavy concentration of organisms it was necessary to expose the heat killed vaccine in a water bath at 62 C. for one hour to kill all the organisms. Equal portions of the six monovalent vaccines were mixed; thus there were 800 million of each Shigella type in each vaccine. Merthiolate 1:10,000 was added to both vaccines and they were stored at 3 to 5 C. The vaccines employed in these experiments were not more than three months old when used.

The strains of Shigella paradysenteriae (Flexner W) used in challenging the human volunteers were freshly isolated strains obtained from the sources shown in table 1.

On the basis of its high virulence for mice and pronounced sensitivity to sulfadiazine, strain F W I, was selected for the experiments designed to determine the minimum infective dose of organisms for man.

EXPERIMENTAL PROCEDURE

A history was taken and a physical examination was performed on the volunteers before inclusion in the study. Two rectal swabs from each volunteer were cultured for Shigella on S. S. agar and only persons with negative cultures and a negative history of a recent diarrheal disease were accepted. Fortunately there was no record of any outbreak of dysentery in the prison during recent years, and none of the patients yielded positive cultures prior to inclusion in the study.

Oral temperatures were recorded twice on the day before and on the day each dose of vaccine was administered and twice on each of the two days subsequent to each inoculation. Local reactions including erythema, edema, induration, tenderness and pain and general reactions of any type were also noted.

Oral temperatures were taken once daily on each volunteer for one week prior to administration of the challenge dose. During the day of the challenge, for at least forty-eight hours thereafter, and during clinical illness temperatures were taken four times daily. Temperature readings were then made twice a day until two weeks after the challenge.

Rectal swabs from each volunteer were cultured at daily intervals for three days just prior to exposure to the challenge infection. Rectal swab cultures were also made daily while the patients were under observation following their exposure to challenge infection.

The organisms used for challenge were grown on veal infusion agar slants, the growth washed off with distilled water just prior to challenge and the number of organisms per cubic centimeter adjusted by comparison with nephelometer standards. The subjects were

TABLE 1.—*Source, Virulence and Sulfadiazine Susceptibility of Strains of Shigella Paradysenteriae (Flexner W)*

Our Designation	Source Designation	LD_{50} for Mice	Highest Dilution of Sulfadiazine Giving Complete Inhibition
F W I	2-13 *	$10^{-7.5}$	1:500
F W II	2633 †	$10^{-5.8}$	1:400
F W III	3050 †	$10^{-6.2}$	1:400
F W IV	43G72 *	$10^{-4.5}$	1:200
F W V	2-10 *	$10^{-4.7}$	1:200
F W VI	7989 ‡	10^{-7+}	1:100
F W vaccine strain	79-118-2W §	10^{-8}	1:50

* Supplied by Army Medical School.
† Supplied by Connecticut Department of Health Laboratories.
‡ Isolated in Illinois Department of Health Laboratories.
§ Supplied by Dr. A. J. Weil.

first prepared for the challenge by giving them each 1 drachm (4 cc.) of paregoric three and one half hours after a meal, followed one half hour later by 2 Gm. of powdered sodium bicarbonate in 1 ounce of water. Five minutes later the dysentery bacilli were given, suspended in ½ pint of milk. The administration of paregoric was repeated at the end of three and six hours.

It was later thought that the use of milk might be interfering with the effects of the challenge material. It was therefore discontinued and the later challenge doses were administered in a glass of water, followed by another glass of water, in order to dilute the gastric secretions and to wash the material through the stomach quickly.

The subjects used in determining the infective dose were challenged in groups of 4. It was planned that the first group be fed 100 million living Shigella organisms. On failure to infect 2 of the 4, the next group were to receive 1 billion living organisms and subsequent groups larger numbers in an attempt to find the dosage that produced a 50 per cent, or more, attack rate in unvaccinated controls.

The established infective dose was to be given to about 15 subjects at a time. Five of these were to have been vaccinated with irradiated vaccine, 5 with heat killed vaccine and 5 were unvaccinated controls. It was planned that they receive the challenge at about

10 a.m. and then were not to be allowed to eat until at least two hours afterward. Since it did not seem to influence the results, they were later allowed to eat lunch within an hour after they received the challenge.

In addition to the temperature records mentioned, careful records were made of each patient's pulse, respiration, clinical signs and symptoms, medication and other pertinent information. The character of stools was checked as follows: consistency, whether watery, semisolid or solid; blood, mucus or pus present; and color and the number of stools was recorded.

Sulfadiazine was to be administered as soon as a definite diagnosis of dysentery could be made. Those who did not show signs of dysentery within four days after challenge were to be given a course of sulfadiazine in order to prevent their becoming dysentery carriers. The dosage of sulfadiazine was set at approximately 1 grain per pound of body weight daily in four divided doses and this was to be continued for five to seven days. Symptomatic therapy was used as indicated and paregoric and bismuth was administered for diarrhea.

All organisms isolated from any of the daily rectal swabs were identified by cultural, biochemical, tinctorial and immunologic tests. Daily swabs for culture were taken until at least five consecutive negative cultures were obtained.

RESULTS

One hundred and thirty-one volunteers were accepted for the study, but of these 9 dropped out for various reasons before they were challenged. Of the remaining 122 volunteers it was necessary to employ 39 in the experiments to establish the infective dose. Only 83 men were available for distribution among the three main groups, i. e. those vaccinated with irradiated vaccine, with heat killed vaccine and the unvaccinated controls respectively. Twenty-five men in the heat killed vaccine group, 28 in the irradiated vaccine group and 30 controls completed the experiments according to plan. Three of those who received one or more injections of heat killed vaccine refused to continue further, while only 1 of those inoculated with irradiated vaccine dropped out of the study on his own volition. The other vaccinated men, together with several controls, had to be eliminated from the study because of prison discipline, illness or discharge from the institution. The median ages of the three groups finally employed were 30 years for the irradiated vaccine group, 30 years for the heat killed vaccine group and 31 years for the control group.

The vaccines both heat killed and irradiated, even in this high dosage, produced only relatively mild reactions. Local areas of erythema, averaging about 5 inches in the largest diameter, occurred in almost all subjects. The areas of edema were usually much smaller, about one-half the extent of the erythematous area. Induration was only rarely noted and its extent, when present, was quite small. There was more local tenderness and pain than had been noted in men inoculated previously in other studies.[9] Eleven of the 28 persons vaccinated with irradiated vaccine had temperatures of 100 F. or over, but the highest was 100.6 F. Of the 25 persons inoculated with heat killed vaccine, 2 had temperatures of 101.4 F., 2 others had temperatures of 101 F. and 101.2 F., and 14 had temperatures of 100 F. or higher. General reactions of some degree were recorded in 19 of the 28 in the irradiated vaccine group and in 23 of the 25 in the heat killed vaccine group. These reactions seemed to consist mainly of mild chills and headache, while a few had backache, aching legs or vomiting. It appeared that general reactions were not only more common but more severe among those who received heat killed vaccine. However, the reactions following administration of either type of vaccine were not as severe as those encountered among subjects inoculated with typhoid vaccine. This is in agreement with the results of previous studies with these antigens.

The first group, I A, of 4 unvaccinated persons who received 100 million Flexner W organisms, strain F W I, in milk, as already described, showed no signs or symptoms except mild headache, anorexia, slight cramps and a feeling of "being tired." Although none of these subjects had diarrhea or fever, Shigella paradysenteriae (Flexner W) was isolated in at least 1 instance from all 4 subjects following challenge; 1 had five successive daily positive cultures beginning forty-eight hours after the challenge dose. His rectal swab cultures then became negative, although chemotherapy was not begun until three days after his first negative specimen. The first positive culture occurred in 1 subject twenty-four hours after challenge; in 2 forty-eight hours after, and in the fourth seventy-two hours after feeding the organisms.

In the second group, I B, of 4 volunteers, who received 1 billion Flexner W organisms strain F W I in milk, the signs and symptoms differed little from those observed in group I A. There were complaints of a feeling of fulness in the abdomen, 1 subject had slight cramps and 1 patient passed four watery stools on the second day after he drank the culture. There was no significant temperature rise. All 4 subjects yielded positive fecal cultures, beginning in each case forty-eight hours after the culture was fed. There was more tendency for positive cultures to persist, 1 subject having 3 positives on successive days; 2 had 5 positives and the fourth had four positives, the last one subsequent to two negative cultures. The last positive culture was obtained on the seventh day after administration of the challenge and the day before chemotherapy was started.

All 4 subjects in group I C received 10 billion Flexner W organisms of strain F W I in milk. None showed elevated temperatures, and the symptomatology was about the same as that seen in the subjects receiving smaller dosages of the same strain. Two had only slight headache, while 2 had severe headache and mild abdominal cramps. Both had two watery stools four days after challenge. It is of interest that both exhibited general pruritus. All 4 subjects yielded positive stool cultures, although 1 patient had only a single positive on the third day after challenge. The other 3 began to excrete dysentery organisms on the second day after they drank the culture, and 2 continued to excrete for seven and eight days respectively. Chemotherapy was begun on the seventh day.

Because it was thought that milk might be delaying the evacuation of the stomach, thus permitting longer action of gastric secretions on the bacteria, it was decided to feed the 4 subjects in group I D with 10 billion Flexner W organisms, strain F W I, in water. These subjects were given sodium bicarbonate and paregoric as in previous experiments. One subject had only slight cramps, but the other 3 were definitely ill. Cramps were noted by these 3 patients within a few hours after the dysentery bacilli were swallowed.

9. Rose, Norman, and others: Unpublished observations. Shaughnessy, Milzer, Neal and Levinson.[6]

and 2 of the patients were nauseated. Headache and chills appeared later, and 2 of the 3 patients passed frequent watery stools, 1 having six bowel movements and the other nine in one day. The third patient vomited and had severe cramps for as long as the tenth day after inoculation. However, none of this group showed temperature elevation. All yielded persistently positive fecal cultures. One became negative the day after chemotherapy was begun, and 1 continued to excrete for three days after sulfadiazine therapy was started.

On the basis of the results in the subjects in group I D it was believed that the end point was being reached. Accordingly, the 4 volunteers in group I E were fed 15 billion Flexner W organisms, strain F W I, in water after the usual preparatory treatment. None of these showed any signs or symptoms during the subsequent twenty-four hours, so they were given 15 billion more bacteria on each of the next two days. Since there had been virtually no response to these feedings, 50 billion more dysentery bacilli were administered on the fourth day. We were disappointed that the only responses to these massive doses of organisms were mild headache, anorexia, slight abdominal cramps and an occasional soft stool. Strangely, none of these subjects began to excrete organisms within forty-eight hours after feeding, and 1 failed to have a positive until the fifth day. Only one continued to excrete until chemotherapy commenced, five days after the final feeding of organisms.

It was obvious that strain F W I, although the most virulent for mice, was not virulent enough to produce a cleancut clinical infection in man, even in overwhelming doses. It was thought that some adjuvant might be needed, perhaps some factor present in infected feces. For these reasons the next group of 8 subjects, group I F, were divided into two groups of 4 each. Four of these were fed a mixture containing 2½ billion each of the four strains F W II, F W III, F W IV and F W V in water. At the same time they were given a gelatin capsule containing about 1 Gm. of feces collected from subject A. C. on the day of the challenge. This patient's feces was known to contain Flexner W organisms in large number. The other 4 subjects were each given capsules containing 1 Gm. of infected feces alone. This was immediately washed down with copious amounts of water. Paregoric was omitted in these experiments. One of the subjects given feces alone had several watery stools on each of three days, mild headache and cramps but no elevation of temperature. The others had only minor complaints of anorexia, cramps or headache. It is of interest that none of these 4 volunteers excreted Flexner W organisms at any time. One of them began to excrete Shigella alkalescens on the same day that the feces were fed, although his previous cultures and those of the "donor" of the feces had not shown the presence of this organism.

In contrast to the essentially negative findings with the infected feces alone, 3 of the 4 subjects fed feces plus the mixture of four strains of dysentery bacilli developed definite signs and symptoms of clinical dysentery. Moderately severe cramps, headache and vomiting appeared about twelve hours after the test dose was given. On the following day the temperature rose to 103.4, 104.4 and 105.0 F. respectively, and the patients were toxic and prostrated. The maximum number of stools per day was six, eight and nine respectively. Mucus was present in the feces of all 3, and 1 patient's feces showed streaks of blood. Sulfadiazine therapy was begun on the day following the challenge, so that the cultures became negative almost immediately. In 1 instance a single positive finding was obtained on a culture made three weeks after the challenge, but sulfadiazine therapy was reinstituted, and subsequent cultures taken over an eighteen day period were negative.

These results seemed to indicate that the infected feces might have acted as an adjuvant. However, we had used a mixture of four new strains in the last attempt, so we had to establish whether it was the new strains or the addition of feces that was responsible for the production of clearcut clinical dysentery. Groups I G and I H consisted of 8 subjects, 4 of whom received a total of 10 billion Flexner W, strains F II, III, IV, and V, in water while the other 4 received the same number of the same strains of organisms and, in addition, each swallowed a capsule containing about 1 Gm. of feces from a normal person. All the subjects who received organisms alone had severe clinical dysentery with maximum temperatures of 103 to 104 F., four to ten watery stools containing blood and mucus and moderately severe to severe cramps, vomiting and chills. On the other hand, only 1 of the 4 who received the same dose of organisms plus normal feces had definite dysentery, but his infection was milder than those experienced by the other group. Organisms appeared in the feces of the subjects receiving feces plus organisms just as early and persisted for as long as or longer than in the feces of those who were given organisms alone.

From these results it appeared that feces was not necessary, and subsequent tests were performed with bacteria in water alone. Since we wished to obtain an infectivity rate of about 50 per cent, the individuals in the next group, I J, consisting of 3 subjects, were given a mixture of 625 million of each of the four strains F W II, F W III, F W IV and F W V in water. This was preceded by the usual 2 Gm. of sodium bicarbonate five minutes previously. Two of these 3 subjects had a moderate form of clinical dysentery with temperatures of 101.4 and 102.0, three or four watery or semisolid stools, cramps and vomiting. Cultures became positive the day after the ingestion of the challange culture and remained positive for from one to three days after sulfadiazine therapy was begun.

It would have been desirable if we could have determined, prior to further studies, whether any of the four strains used to infect the subjects in groups I F, I G, I H and I J could produce infection when ingested alone or whether a combination of the strains was necessary. An insufficient number of volunteers remained, however, to make the extensive tests necessary to settle this point. It was therefore decided to challenge the vaccinated groups and their controls with mixtures of the four strains of Flexner W used in the experiments that have been described. The LD_{50} for mice of this four strain mixture was found to be $10^{-5.8}$. Later attempts were made to detect which of the four strains were virulent for man.

The first group of vaccinated persons and their controls were challenged with a mixture of the four strains totaling 2½ billion organisms, given in water. This dosage produced moderate or severe dysentery in all 5 controls, whereas only 3 of the 5 volunteers vaccinated with irradiated vaccine developed dysentery, 1 having a mild case, and 4 of those who had received heat killed developed the disease, 3 having mild cases. Accord-

ingly, the next group challenged received a total of 1 billion organisms, representing equal portions of the four strains of Shigella. In this case 2 of the controls developed severe dysentery, while the other 3 failed to show sufficient signs and symptoms to be classified as clinical cases. In contrast, 2 of the subjects who had been inoculated with the heat killed vaccine developed severe or moderate dysentery and the other 3 mild dysentery, while all 5 who had received irradiated vaccine developed severe or moderate dysentery.

Because less than 50 per cent of the controls came down with dysentery when fed 1 billion organisms, the next two subgroups were challenged with 2½ billion of the four strain mixture of Shigella. With this dosage 7 of 10 controls developed moderate or severe dysentery. Four of the heat killed vaccine group showed signs of moderate or severe dysentery, 2 had mild dysentery and 2 failed to come down with the disease. All 9 in the irradiated vaccine group had dysentery, 8 of them moderate or severe infections.

In the next group, also challenged with 2½ billion of the four strain mixture, 2 of the 5 controls had moderate or severe dysentery, 1 mild dysentery and 2 escaped. Of the 4 volunteers in the irradiated vaccine group, 2 had mild dysentery and 2 had no disease. Of the 5 volunteers in the heat killed vaccine group, 4 escaped infection and 1 had severe dysentery. It appeared that all the cases were milder than had been seen previously, so it was decided to increase the challenge in the next group to a total of 4 billion, representing a billion organisms of each of the four Shigella strains. Even with this larger challenge, 3 of the 5 controls failed to develop dysentery and the other 2 had mild infections. Strangely enough, 4 of the 5 subjects injected with irradiated vaccine developed dysentery, 2 mild and 2 moderate or severe. Only 2 subjects were available in the heat killed vaccine group and both of these developed dysentery, 1 a severe case.

TABLE 2.—*Summary of the Results of Feeding Living Shigella to Human Volunteers*

Type of Vaccine	Number of Volunteers Tested	Number with Mild Dysentery	Number with Moderate or Severe Dysentery	Total with Dysentery	Per Cent Developing Dysentery
Heat killed.....	25	9	9	18	72
Irradiated.....	28	6	17	23	82
None (control).....	30	3	16	19	63

A summary of the results of all these experiments is shown in table 2. Variations from experiment to experiment were so great, even in the incidence of dysentery in the controls, that it does not appear that the differences between any of the groups are great enough to be significant. The chi square test for significance was applied to these data and it was found that the differences in the attack rates in the various groups could have happened by pure chance in about six out of ten trials.

In analyzing the results of these experiments it was necessary to draw up criteria defining dysentery. It was finally decided that in order to be considered to have an attack of dysentery the patient must have had a temperature of at least 100 F. by mouth during at least one of the four days following the feeding of Shigella organisms or he must have passed three or more stools in any one day during the week following the challenge. At least one of the stools must have been watery or semisolid. To be considered to have a moderate or severe attack of dysentery it was required that the subject have had a temperature of more than 101 F. by mouth during the four day period mentioned and, in addition, at least three stools in one day or, alternatively, he must have had five or more stools in one day, at least two of which were watery or semisolid, and chills, severe cramps or vomiting.

As already mentioned, an attempt was made to determine whether any one of the four strains used in the challenge of the vaccinated persons was capable of producing dysentery in man when ingested alone. Because of a shortage of volunteers and hospital beds this part of the study had to be done on single subjects. Culture F W II in a dose of 1 billion organisms in water produced dysentery of moderate severity; culture F W III in the same dosage produced only mild dysentery; culture F W IV in a dosage of 2 billion organisms gave rise to a temperature of 99.6 F. and a few cramps; and culture F W V in a dosage of 2 billion bacilli produced no symptoms. However the latter 2 cultures were fed to volunteers at the end of the investigation when a total of 4 billion organisms in the four strain challenge was able to produce only relatively mild symptoms. Possibly, if these single strains had been tested earlier, all would have been shown to have been virulent.

COMMENT

The local reactions following inoculation with either heat killed or irradiated vaccine consisted largely of moderate areas of erythema and edema in most cases without induration. The reactions tended to be more severe in the group which received heat killed vaccine than in those inoculated with irradiated vaccine. In general, however, the reactions, both local and general, were mild or moderate and there was general agreement that the reactions following inoculation with typhoid vaccine were more severe than those encountered in these studies.

The incubation period in the experimentally produced infections was remarkably short. When the dosage of living organisms was sufficient to produce moderate or severe dysentery, the subjects began to have nausea, vomiting or cramps, usually within twelve hours after ingestion of the challenge and practically always within twenty-four hours. In these subjects diarrhea usually began within eighteen to twenty-four hours after the challenge infection. When the dosage of organisms was such that mild or questionable dysentery was produced, the incubation period tended to be slightly longer, but even in this case the onset of signs and symptoms usually occurred within thirty-six to forty-eight hours. In only 3 subjects was the incubation period longer than forty-eight hours. It is of interest that when the subjects experienced only mild symptoms such as mild cramps, headache and bloating, without temperature elevation, symptoms so mild that we did not consider them to be evidence of clinical dysentery, the initial appearance of these findings also usually took place within twenty-four to forty-eight hours and lasted only about twenty-four hours. It is, of course, possible that the administration of sulfadiazine, which was given to symptomless subjects four days after challenge, in the later experiments, may have prevented the appearance of cases with long incubation periods. However, it is believed that this did not occur, since, in the earlier experiments with strain F W I, chemotherapy was not instituted until at least

six days after challenge and in some cases not until nine days later. Furthermore, the previously accepted data on the incubation period in dysentery is given as one to seven days, usually less than 4 days.[10] In the later experiments in which we were dealing with strains which produced obvious clinical dysentery in a majority of subjects, the incubation period was so short that the routine administration of sulfadiazine to all asymptomatic subjects four days after feeding living Shigella can hardly be considered to have prevented late appearing cases.

Analysis of the symptomatology shown by the infected subjects brings out the fact that nausea and vomiting were early and prominent signs of infection. This fact, coupled with the short incubation period, would make it difficult to make a differential diagnosis between bacillary dysentery and salmonellosis or staphylococcus "food poisoning" solely on a clinical basis. This again strongly emphasizes the need for making bacteriologic tests to determine the etiology of every outbreak of gastroenteritis.

One of the most striking findings in the study was the nonrelation between the mouse virulence of Shigella strains and their ability to infect man. This could not be studied exhaustively, but it has been shown that strain F W I, which had a virulence for mice such that approximately 10 organisms killed half the animals injected, was unable to produce clearcut clinical infection in man even when administered in a total dosage of 95 billion. On the other hand, none of the four strains finally used in the challenge mixture were as virulent as strain F W I. Their virulence for mice in the mixture used was such that it required about one hundred times as many organisms to kill mice as strain F W I. Yet this mixture of four organisms proved to be highly virulent for man.

It was also noted that there seemed to be a noticeable decrease in the virulence for man during the course of the experiment which lasted several weeks. In the experiment on the subjects in group I D mild dysentery was apparently produced in at least 2 of the 4 volunteers following ingestion of 10 billion living F W I organisms. Yet, in the next experiment with the same strain, carried on about two weeks later, virtually no effect was produced by feeding 95 billion organisms of the same strain. In the case of the mixture of four strains it was found in the first tests that a dosage of 1 billion organisms produced moderate dysentery and that 2½ billion produced severe infection. In the last tests it was found that 4 billion organisms appeared to produce a milder degree of infection than was originally produced by 1 billion of the same mixture. It is regretted that a shortage of mice prevented attempts to learn whether there was a concomitant change in their virulence for mice.

It is obvious from the analysis of the results that significant immunity was not exhibited by the persons vaccinated with either heat killed or irradiated vaccine. There were about the same percentage of cases in the three groups exposed to challenge in the various experiments, and the severity of the infection in the vaccinated individuals, with the possible exception of those in the heat killed vaccine group, was fully as great as in the controls. We believe, however, that the apparent differences in the percentages of volunteers in the various groups who had only mild dysentery can be accounted for on the basis of chance. There was so much variation in the severity of the signs and symptoms of dysentery from experiment to experiment that we believe that differences in the severity of clinical symptoms are probably determined by factors not controllable in such an experiment. However, application of the chi square method indicated that the observed differences in severity might occur by pure chance alone about once in twenty times. Therefore it may be that the differences in the severity rates observed in the different groups are statistically significant.

We may speculate on some of the reasons for failure to demonstrate immunity in these studies. In the first place, the strains of Shigella used in making the vaccine may not be immunogenic for man. They were selected on the only basis then available, a high degree of virulence for mice and somatic antigen content. While these criteria may be satisfactory in the case of other types of antigens, there is no assurance that they are desirable in Shigella vaccines. It has been learned in pertussis immunization, for example, that man must be immunized with strains freshly isolated from cases or maintained in the laboratory in phase I, the condition in which they are found in natural infection. It is possible, therefore, that only Shigella strains which are known to be virulent for man should be used in the preparation of dysentery vaccines.

It is possible that the dosage of antigen was inadequate. A total of 12 billion organisms was administered but, because of the polyvalent nature of the vaccine, there were only 2 billion organisms of each Shigella type injected. In the case of typhoid vaccine, it is believed that a dosage of this order is sufficient. On the other hand it is believed that the number of pertussis bacilli necessary for satisfactory immunization should be in the neighborhood of 90 billion. An estimate of the proper content of Shigella organisms in a dysentery vaccine can only be a guess at this time.

Since the vaccine was prepared from cultures grown on the surface of agar, it probably contained no exotoxin (if these organisms are capable of producing such substances). It is also possible that most of the endotoxin which might have been liberated during the incubation of the organisms was not collected because of the conditions employed in growing and harvesting the organisms for the vaccines used in these experiments. Therefore, these may have been inadequate stimulation of antitoxic immunity.

The spacing of injections of vaccine was arbitrarily set at two weeks in these studies. It was also arbitrarily decided to challenge two weeks after the final injection of vaccine. Perhaps, if the spacing of injections had been wider or a longer interval had been allowed to elapse between the final injection of antigen and the challenge, there might have been a greater degree of immunity.

The possibility must be considered that the methods used to kill the organisms in the vaccines were also effective in destroying the immunogenic factors in the bacteria. The results obtained in our previous studies on animals would indicate that this contingency is unlikely but, in the absence of proof to the contrary, it must be given consideration.

Finally, it must be remembered that bacillary dysentery might be one of those diseases against which it is impossible to stimulate a significant degree of immunity. Dysentery is essentially a local infection of the lining of

10. The Control of Communicable Diseases, ed. 6, New York, American Public Health Association, 1945.

the intestine. There is usually no invasion of the other viscera or of the blood stream, and infection is not followed by the production of humoral antibodies in any significant titer. It is a well known fact that repeated attacks of bacillary dysentery, apparently caused by the same Shigella type, may occur in the same individual within short periods of time. Possibly, therefore, stimulation of active immunity against bacillary dysentery cannot be achieved with any type of vaccine.

The effectiveness of sulfadiazine in controlling clinical dysentery and suppressing the carrier state in this rather large group of individuals is worthy of mention. The strains used for challenging the subjects were chosen for their sensitivity to sulfadiazine, as well as for their virulence for mice, but this does not, we believe, invalidate the findings. Among the reasons for the good results from chemotherapy are its prompt institution as soon as a diagnosis could be made and the relatively large dosage employed.

In our opinion there should be further studies of this kind in order to determine, if possible, whether vaccination against bacillary dysentery in man is feasible or not. In any future studies it appears to us that the vaccines used should be prepared from strains recently isolated from human cases of dysentery and of proved virulence for man. The factors of dosage of vaccine, spacing of injections of vaccine and interval between vaccination and challenge should also receive especial attention.

CONCLUSIONS

In a study in which experimental bacillary dysentery was successfully produced in man the incubation period in the experimental disease with few exceptions was not longer than twenty-four hours.

It was found that the strain of Shigella which was most virulent for mice failed to produce clinical infection in man, while other strains of much lower virulence for mice produced severe dysentery in man.

During the course of the experiments, a period of several weeks, it appeared that the virulence for man of the Shigella strains employed decreased noticeably.

Human volunteers vaccinated with heat killed and ultraviolet irradiated vaccine, which produced a high degree of immunity in mice and a significant increase in mouse protective antibodies in man, showed no significant immunity against experimental infection.

Sulfadiazine effectively controlled the disease and rapidly suppressed the carrier state.

1800 West Fillmore Street, Chicago 12.

Electrical Activity in the Heart.—The electrocardiogram does not replace the ordinary clinical history and examination. It regards the events of electrical activity in the heart but does not always "tell all." The evidence it presents can often not be obtained otherwise. The fact that the electrocardiogram is normal cannot be considered as objective proof that the heart is normal in all instances. There are "silent" areas in the heart, electrically speaking. On the other hand, an abnormality in the electrocardiogram does not necessarily reveal the clinical status of the heart although it can be considered as objective evidence of some sort of cardiac abnormality. Finally, the interpretation of the events pictured in the electrocardiogram rests as much on the ability and experience of the cardiographer as does the clinical examination on that of the clinician. With a thorough understanding of its limitations and of its value, the practitioner can give it its true place, but it is as much of an error to expect too much from it as to ignore the valuable information it can give.—Katz, L. N., and Kaplan, L. G.: The Meaning of the Electrocardiogram and Its Value to the General Practitioner, *Clinics*, June 1946.

PENICILLIN IN THE TREATMENT OF SYPHILIS IN CHILDREN

JOSEPH YAMPOLSKY, M.D.
and
ALBERT HEYMAN, M.D.
Atlanta, Ga.

Although there are many reports on the use of penicillin in the treatment of syphilis in adults, little information is available regarding the value of penicillin in the treatment of the disease in children.

Congenital syphilis is often severer than the acquired infection. Doses of penicillin comparable to those effective in adults are not entirely satisfactory in the treatment of the infantile infection, and further investigation of this problem is necessary. Moreover, such syphilitic manifestations as interstitial keratitis, eighth nerve deafness and Clutton's arthritis are found predominantly in the congenital infection, and detailed observations on the response of these diseases to penicillin are lacking.

It is the purpose of this report to present the results of treatment with penicillin in 61 children with various manifestations of syphilis.

INFANTILE CONGENITAL SYPHILIS

During the past twenty months we have treated with penicillin alone 32 children with infantile congenital syphilis. The results of the penicillin treatment in some of these patients have been reported in detail elsewhere.[1] At the onset of treatment, 24 of the children were 4 months of age or less, 6 were less than a year old and 2 were 15 and 17 months old, respectively. Eleven of the children were boys and 21 girls; 2 were white and 30 were Negro. None had received previous treatment, and all of them had manifestations of congenital syphilis at the start of penicillin therapy.

In the early part of this work, doses of 40,000 to 50,000 units of penicillin per kilogram of body weight were employed, but this was later increased to 60,000 to 70,000 units when failures in treatment were observed. Sodium penicillin in isotonic solution of sodium chloride was given intramuscularly every three hours for a total of sixty doses in seven and one-half days. Even with the increase in dosage relapses were found to occur, and the dose of the drug was again increased. We are now giving a total dose of 100,000 units per kilogram of body weight in equally divided doses, intramuscularly, every three hours for ten days. No further therapy is given, and serologic tests and periodic observations are made at regular intervals.

Seven of the children have been followed for four to eight months, while 22 children have been observed for twelve to twenty months. The remaining 3 patients died soon after treatment. An immediate clinical response was observed in all patients, and healing of the cutaneous and mucosal lesions often occurred by the end of the course of treatment. Osseous lesions also

Read before the Section on Pediatrics at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 4, 1946.

Dr. Curtis Benton assisted in the treatment of the patients with interstitial keratitis, and Dr. Thomas Bivins performed audiometric examinations on the children with eighth nerve deafness.

From the Departments of Pediatrics and Medicine of Grady Memorial Hospital and Emory University School of Medicine and from the Clinic for Genitoinfectious Diseases of the Georgia Department of Public Health.

The penicillin was provided by the Office of Scientific Research and Development from supplies assigned by the Committee on Medical Research for clinical investigation recommended by the Committee on Chemotherapeutic and Other Agents of the National Research Council.

1. Heyman, A., and Yampolsky, J.: The Treatment of Infantile Congenital Syphilis with Penicillin, Am. J. Dis. Child. **71**: 506 (May) 1946. Platou, R. V.: Penicillin Therapy in Early Congenital Syphilis, J. A. M. A., to be published.

showed prompt improvement, but complete resolution did not usually occur for two to three months.

The results of treatment of this group of patients with penicillin are shown in table 1. Eighteen of the children now have doubtful or negative blood tests, are physically well and have normal spinal fluids. The serologic test for syphilis often became normal in three to six months, but patients with originally high titers sometimes required nine to fourteen months for a complete serologic reversal to occur.

In 5 patients the serologic test is continuously decreasing in titer, but the reaction is not yet negative. These patients, however, have been followed for only four to eight months. Four children continue to show positive serologic tests for syphilis sixteen to eighteen months after treatment. Although these patients have not yet been retreated, the results are regarded as unsatisfactory.

Two of the patients developed a serologic relapse and were regarded as definite treatment failures. In 1 of these patients the quantitative reaction to the Kahn test fell immediately after treatment with 42,000 units of penicillin per kilogram of body weight. Five months later, however, the titer rose above the original level. The other patient had a titer of 10 Kahn units at the onset of treatment and was given 60,000 units of penicillin per kilogram of body weight. Although the cutaneous and osseous lesions in this patient healed promptly, the Kahn titer gradually rose to 640 units during the following six months. Both children had positive spinal fluids six months after treatment. These children were retreated with double the original amount of penicillin and are now doing well, but they still retain positive serologic reactions.

TABLE 1.—*Results of the Treatment With Penicillin of 32 Children With Infantile Congenital Syphilis*

Clinically well and serologic test negative	18 *
Clinically well and serologic titer decreasing	5
Clinically well and seroresistant	4
Clinically worse and serologic relapse	2
Deaths	3

* The serologic test for syphilis in 1 of these patients is doubtful.

There were 3 deaths in this series. Two fatalities occurred in premature, malnourished infants soon after treatment was completed. It is felt that these 2 deaths were the results of the extensive damage produced by congenital syphilis. The third fatality occurred six weeks after completion of treatment. This child seemed to show a good response to penicillin but died after an unexplained acute febrile illness, which was not thought to be related to the syphilitic infection.

Herxheimer reactions occurred in approximately one half of the cases. These consisted of sharp elevations of temperature, which did not appear to be injurious to the child. These reactions occurred despite the administration of the drug in gradually increasing doses. No other reactions were observed.

INTERSTITIAL KERATITIS

Nine patients with interstitial keratitis were also treated with penicillin. Four of these infections were only moderately severe, while those of the remaining 5 patients indicated extensive involvement.

Each patient was given approximately 50,000 units of penicillin per kilogram of body weight, intramuscularly, in equally divided doses every three hours for seven and one-half days. The keratitis became worse in 4 patients, and fever therapy had to be started. In 3 others, the condition improved somewhat and no further therapy was necessary. Penicillin appeared to be extremely effective in only 1 instance. This patient showed a rapid decrease in circumcorneal congestion and immediate clearing of the corneal opacity. Two weeks later, however, the keratitis recurred and involved the other eye. Retreatment with penicillin was again effective.

In 1 patient interstitial keratitis developed two weeks after the administration of penicillin for Clutton's arthritis. Further penicillin therapy in this patient resulted in a slow but satisfactory regression of the ocular process.

The serologic titer of most of these patients fell slightly, but no reversals of the serologic test have thus far been observed. In only 1 of these patients did penicillin therapy achieve excellent results, with the return of near-normal vision. All the others continue to show moderate to severe visual impairment. Although penicillin solution was instilled locally in several patients, this procedure did not seem to improve the results of treatment.

CLUTTON'S JOINTS

Three children with symmetric hydroarthrosis were treated with penicillin. Each patient was given a total dose of 50,000 units per kilogram of body weight in seven and one-half days. Two patients did not show any response, and the joint effusion remained in the knees for several months after treatment.

Although the synovitis seemed to improve in the third patient, the effusion reappeared in the other knee soon after the patient was discharged from the hospital. A week later the interstitial keratitis mentioned in the foregoing paragraph developed in this patient.

ACQUIRED SYPHILIS IN CHILDREN

Seven children with acquired primary and secondary syphilis were treated with penicillin alone. All of them were over 3 years of age and had positive dark field lesions at the onset of treatment. These patients were treated with doses of penicillin comparable to those used in adults, i.e., 40,000 units per kilogram of body weight.

The syphilitic lesions healed promptly in every case and the spirochetes disappeared rapidly. All these children have been followed for at least six months. The serologic tests for syphilis thus far have become negative in only 2 patients. Most of the other patients, however, show a definite fall in the serologic titer and will probably have a satisfactory outcome.

CONGENITAL NEUROSYPHILIS

Six patients with late congenital asymptomatic neurosyphilis were also treated with penicillin. Most of these patients had received adequate arsenic and bismuth therapy previously with no apparent effect on the spinal fluid observations. The age of these patients at the onset of treatment ranged from 10 to 25 years. The spinal fluid in the majority of these patients had group III findings and showed a strongly positive Wassermann test with an elevation in the cell count, the protein level and the mastic curve reaction.

These patients received a total dosage of 40,000 units of penicillin per kilogram of body weight in seven and one-half days. There was a reduction in the cell count and protein level immediately after treatment in almost every patient. Four patients have obtained a satisfactory spinal fluid response and the mastic curve,

protein level and cell count are normal one year after treatment. The spinal fluid response to the Wassermann test in each of these patients is still positive, but there has been a reduction in titer. One of the 2 other patients with congenital neurosyphilis has a slight elevation of the cell count one year after treatment, while the second patient continues to exhibit a decidedly elevated protein level in the spinal fluid.

We have treated 2 patients with juvenile paresis with penicillin alone. Neither of these children displayed much clinical change, but the spinal fluid indicated some improvement.

Two children with recent progressive eighth nerve deafness were also given penicillin, and doses of 100,000 units per kilogram of body weight were used. Careful audiograms were taken before and after treatment. No change was observed in the severer case of deafness three months after the completion of therapy. In the milder case, however, some improvement in hearing has occurred.

COMMENT.

The result of penicillin treatment of syphilis in children varies considerably and depends on the type and duration of the infection.

In this study, 23 of the 32 infants with infantile congenital syphilis have obtained a satisfactory response. These 23 children now present a normal response to the serologic test or have a steadily decreasing titer. All of them are clinically well, have normal spinal fluids and exhibit no clinical evidence of the disease. Four children have persistently positive Kahn tests sixteen months after treatment. These patients were older than 4 months at the onset of treatment, and their seroresistance is believed to be the result of late diagnosis and treatment.

We do not believe that the 3 fatalities in this series are related to penicillin therapy. Two of the deaths apparently resulted from an overwhelming syphilitic infection in premature and malnourished infants, while the third fatality remains unexplained.

Although penicillin was ineffective in the 2 infants who developed serorelapse, both of these patients have responded satisfactorily thus far to larger doses of the drug.

The results obtained in this study indicate that penicillin is an effective agent in the treatment of infantile congenital syphilis. Although the optimum dosage of penicillin cannot be determined in such a small series of cases, we believe that a total dose of penicillin of 100,000 units per kilogram of body weight is effective in the treatment of the majority of these cases.

The results obtained in the treatment of interstitial keratitis indicate that this condition is refractory to parenteral penicillin therapy. The poor response of this manifestation to all forms of antisyphilitic therapy has long been observed. Recent work by Woods and Chesney [2] has indicated that the refractoriness of interstitial keratitis to treatment is due to the lack of vascularity of the cornea and the low concentration of the antispirochetal agent in the cornea. Although satisfactory concentrations of penicillin in the ocular tissues are said to occur after the local instillation of penicillin, this form of therapy did not improve the results in our cases.

No response was obtained in any of the patients with Clutton's joints who were treated with parenteral penicillin. This type of arthritis is also refractory to routine antisyphilitic treatment. The exact pathogenesis of this disease, as well as that of interstitial keratitis, is obscure. It seems probable, however, that the poor response of both these syphilitic manifestations to penicillin therapy is in some way related to immunologic factors, the nature of which is still poorly understood.

All the children with acquired syphilis who have been treated with penicillin have thus far obtained a satisfactory response. The number of such cases in this series is small and the period of observation is relatively short. However, it appears that doses of penicillin comparable to those found effective in acquired syphilis in the adult are also effective for the treatment of this form of the disease in children.

In general, the result of penicillin therapy in late congenital asymptomatic neurosyphilis is satisfactory. Although none of the patients with this disease developed normal spinal fluids, the response to penicillin is comparable to that observed after fever therapy. The 1 patient who continues to show an elevation of the cell count a year after receiving penicillin is regarded as a treatment failure and should receive fever therapy. It should be emphasized that most of these patients with asymptomatic neurosyphilis had previously received prolonged arsenic and bismuth therapy without apparent effect on the spinal fluid; the good results following the administration of penicillin indicate that this drug is far more effective than arsenic and bismuth preparations in the treatment of this disease.

Although a rapid reversal of the spinal fluid abnormalities occurred in the infants treated with penicillin, the changes in the spinal fluid in older children were much slower. This difference in the response of the spinal fluid in early and late congenital neurosyphilis has been observed to a lesser degree in the acquired form of this disease.

Penicillin appears to be effective in the treatment of early neurosyphilis and late asymptomatic neurosyphilis. However, the results obtained in the 2 children with juvenile paresis were disappointing. Both children had to be committed to mental institutions; only slight improvement was apparent after penicillin therapy. In both of these patients the disease was far advanced at the onset of treatment, and the response of such patients to any form of antisyphilitic treatment is usually discouraging.

One patient with slight eighth nerve deafness obtained a fairly good response to penicillin, but the child with severe deafness showed no improvement. This manifestation of congenital syphilis is in general refractory to other forms of treatment. Although a good response was obtained in only 1 patient, this may be significant and may indicate that penicillin is useful in the treatment of the earlier and milder forms of this manifestation.

The results described in this report must be interpreted in the light of the fact that commercial penicillin has been a changing mixture of various substances. The content of impurities has gradually decreased as potency in terms of units per milligram has increased. The relative amount of the several identified penicillin fractions G, F, X and K, has likewise varied from time to time. These two changes, and perhaps others, suggest that therapeutic efficacy may not have remained constant, and that it may be significantly different today than it was originally.[3] It is not now possible to assess the extent to which these changes may have affected the results here reported. The manufacturers of peni-

2. Woods, A. C., and Chesney, A. M.: Relation of the Eye to Immunity in Syphilis with Special Reference to the Pathogenesis of Interstitial Keratitis, Am. J. Ophth. **29**: 389, 1946.

3. Commercial Penicillin: Committee on Medical Research, the U. S. Public Health Service and the Food and Drug Administration, J. A. M. A. **131**: 271 (May 25) 1946.

cillin are now taking practical steps to correct this situation. In the meantime, it seems advisable that the doses of penicillin recommended in this report be at least doubled in order to maintain its efficacy in the treatment of syphilis in children.

SUMMARY

Sixty-one children with various manifestations of syphilitic infection were treated with penicillin. The drug appears to be an effective agent in the treatment of infantile congenital syphilis, and satisfactory results were obtained in 23 of 32 children treated for this condition.

The majority of patients with interstitial keratitis did not obtain satisfactory results with parenteral penicillin, which was also of little value in the treatment of Clutton's arthritis.

Acquired syphilis in children seemed to respond readily to doses of penicillin comparable to those used in adults.

The changes in the spinal fluid in late congenital asymptomatic neurosyphilis were in general satisfactory and comparable to those obtained with fever therapy.

Little or no clinical improvement was noted in juvenile paresis treated with penicillin. One patient with mild eighth nerve deafness obtained improvement in hearing after receiving penicillin.

In general, the results obtained with penicillin in the treatment of syphilis in children seem to depend on the nature and duration of the disease. Although penicillin appears to be effective in the treatment of infantile congenital syphilis and in early neurosyphilis, little or no response can be expected in the treatment of the late manifestations of this disease.

ADDENDUM

Since this paper was submitted for publication, 2 of the patients have returned with evidence of relapsing syphilis. In 1 of the patients, who had been treated with penicillin for interstitial keratitis, there developed a recurrence of this condition. Retreatment with penicillin was effective, however. The other patient had received penicillin for acquired syphilis and now shows a rising titer of the serologic test for syphilis.

ABSTRACT OF DISCUSSION

DR. OSCAR REISS, Los Angeles: I am faced with discussing a condition in the treatment of which I have had a meager experience. My remarks are based largely on observation of the work of my colleagues plus a study of the literature. So much interest has been aroused in the use of this drug that a voluminous literature has sprung up rapidly. However, most of the reports have concerned themselves with the treatment of adults. Yampolsky and Heyman offer us the benefit of their experience in the treatment of syphilis in children. It parallels to a large degree the successes and failures encountered in the treatment of adults and leads one to believe that we are not yet prepared expertly to evaluate the effectiveness of penicillin. However, when one considers the relative harmlessness of this drug, further extensive studies should be undertaken, particularly with consideration of the use of larger dosage and selection of type of penicillin. Because of the vast therapeutic vista that penicillin has opened up, it is fitting that the committee on medical research and the U. S. Public Health Service have combined in a nationwide study begun in September 1943. Two articles were published by them in the May 25 issue of THE JOURNAL, from which it seems pertinent to quote two conclusions: "Penicillin as commercially distributed is not a single substance but a mixture of several. At least four different penicillin species which differ chemically in the side chains attached to the basic nuclear structure have been identified. These are known in the United States as penicillin G, X, F and K." "The changing character of commercial penicillin is reflected in the fact that the results of penicillin treatment of early syphilis have been less satisfactory since May 1944 than prior to that date." I wish to commend the authors on the thoroughness of their study and to express the hope that we may hear from them further on this subject.

DR. JOSEPH YAMPOLSKY, Atlanta, Ga.: You can now get on the market a commercial penicillin which contains about 95 per cent of the component G. This is the biggest advance in the true evaluation of the treatment of syphilis in children with penicillin. In this manner we can get better results than we have with the old commercial penicillin. It is probable that just as satisfactory results can be obtained in the treatment of congenital syphilis with other drugs, but one must remember that the rapidity of treatment is one of the most important factors in eradicating congenital syphilis.

DIVERTICULOSIS AND DIVERTICULITIS OF THE COLON IN YOUNG PEOPLE

CARL BEARSE, M.D.
Boston

Comparatively little has been written on the subject of diverticulosis and diverticulitis of the colon in young persons. Indeed, it has been generally accepted that these conditions hardly ever occur in patients under 30 years of age. It has even been stated that so far as the distal colon is concerned, diverticula are never found in children.[1] Inasmuch as I have had 7 patients under 30—6 in their twenties and 1 aged 12—with diverticulosis or diverticulitis of the colon, and since 4 of these were seen within a three year period and 2 were operated on within nine months, I believe that these conditions may be far more common in the young than physicians have been led to assume.

The data on which the prevailing concept of the incidence of diverticulosis of the colon is based consist of postmortem reports and radiographic investigations of patients who presented abdominal symptoms. However, neither of these criteria can be relied on to present accurately the relative frequency of diverticulosis in young persons.

Series of unselected autopsies cannot equably establish the distribution of this condition by decades. The yearly mortality under the age of 30 is only 0.4 per cent and under 40, 0.45 per cent.[2] Statistics on postmortem colonic examinations in the young, therefore, lag far behind similar data available in older age groups. Reports derived from gastrointestinal roentgenologic examinations are similarly deceptive. Such studies are made less often in children and young adults than in older persons. Symptoms related to functional and organic lesions of the stomach, intestines and biliary tract are far less frequent in young patients. Only if these studies as well as postmortem examinations were made by decades and in comparable numbers could deductions as to the frequency of diverticulosis in the various age groups be safely drawn. Therefore, one must assume that, as regards the incidence of diverticulosis in young persons, the usually cited statistics are entirely inadequate.

Consideration of the embryologic basis for the development of diverticula makes it no less easy to under-

Read before the Section on Gastro-Enterology and Proctology at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 4, 1946.

1. Reineke, H. G.: Diverticulitis of the Colon, Ohio State M. J. **40:** 939 (Oct.) 1944.

2. Vital Statistics—Special Reports (Summary of the United States Registration Area: 1936), U. S. Department of Commerce, Bureau of the Census, 1938, vol. 4, pp. 957-958.

stand why they are not found oftener in young persons. The bowel itself is developed from a diverticulum; and from the bowel the liver, pancreas, cecum and appendix arise as diverticula. In regions where diverticula are thus a normal development, sporadic secondary diverticula may be expected to occur.[3] Anatomically, the external longitudinal muscle of the colon does not constitute a continuous sheath; this muscle is arranged in three longitudinal bands and between these bands, especially at the points where blood vessels pierce the wall of the bowel, the intestinal wall is more vulnerable than in the areas occupied by the bands.[1] But no matter at what age diverticula may form, one must postulate some inherent weakness in the bowel wall that favors the formation of these sacculations. It is conceivable that alterations in the function of the inhibitory nerves of the colon may be a factor.[4] Tuberculosis, healed and active, may predispose toward their formation.[5] It is possible that such factors as constipation, the inescapable wear and tear on the colon and appreciable variations in the weight of the patient, both on the profit and on the loss side, may contribute to their expansion and enlargement. Thus diverticula may become larger, and therefore easier to find, as the patient grows older. If a congenital origin of diverticulosis is accepted as a basic concept, it follows that when diverticula are discovered in the older patient they may have been present for many years and may even be true anatomic anomalies.

The distribution of diverticula in young patients—at least in the 7 I have seen—follow the pattern of those in the older age groups. They occur most frequently and are most numerous in the sigmoid, becoming less frequent as the cecum is approached. Two of my patients had diverticula of the sigmoid, 1 of the sigmoid and descending colon, 3 of the transverse colon and 1 of the ascending colon. In the patient aged 12 the diverticula were in the transverse colon.

It has been said that all persons with diverticulosis have symptoms.[6] It is, however, more reasonable to assume that with abdominal discomfort some degree of diverticulitis exists. It must be conceded that without an operation a clinical diagnosis of diverticulitis is usually open to some doubt. The roentgenologic examination cannot always corroborate the diagnosis because edema may seal the ostiums and prevent barium from entering. The evidence by proctoscopy is not dependable; the mucosa is not involved[7] and no opening to a diverticulum may be visible.

The larger the diverticulum the proner it is to fecalithic irritation or impaction and the closer the resemblance of this condition to what may happen in the appendix. Considerable time may elapse before diverticulitis takes place, if it ever does, and it is therefore to be expected that this disease will occur more frequently in the later decades of life. This does not mean, however, that diverticulitis severe enough to warrant an operation may not occur early in the course of diverticulosis. Four of my 7 patients who were under 30 required surgical intervention. Three had a perforation with abscess which required drainage;[8] 1 abscess was of the ascending colon and 2 were of the sigmoid. The fourth patient showed an inflammatory mass which involved the transverse colon. Inasmuch as it had not suppurated it was not disturbed, and spontaneous resolution took place.

At the Liverpool Royal Infirmary, within a period of a few months, 3 patients in their twenties who were operated on for acute appendicitis were found instead to have diverticulitis of the cecum. Of 17 additional cases of cecal diverticulitis collected from the literature, 5 or 29 per cent were under 30 and 7 or 41 per cent were under 40.[3a] On the other hand, of a series of patients operated on for diverticulitis, chiefly sigmoidal, only 5.2 per cent were under 40.[9] Such pronounced variation in reports on the incidence of diverticulitis in young patients can perhaps be best explained on the basis of the greater difficulty of correct diagnosis on the right side, because of which the operation was performed prematurely. Many such patients who were operated on would undoubtedly have recovered without surgical intervention, for in only 16 to 26 per cent of the patients with diverticulitis is an operation necessary.[10] In diverticulitis of the colon on the left side, where the differential diagnosis is fairly easy, an operation is undertaken only after there is evidence of the development of complications.

When surgical intervention is indicated for acute diverticulitis in young patients it is usually because of perforation and abscess. By the time chronic obstruction or fistulous formation occurs as a result of recurrent attacks of diverticulitis in the same segment of the colon patients are usually in the older age groups. Failure to recognize an impacted diverticulum or uncomplicated diverticulitis at the time of operation has resulted in unnecessary surgery. Extensive intestinal resections have even been performed for these benign conditions. It is conceivable that in older persons diverticulitis may be mistakenly suspected of malignancy, but in young patients errors in diagnosis are no doubt caused by failure to consider the possibility of the presence of this disease.

It has been stated pessimistically that herniation of mucous membrane, once started, cannot be arrested; that diverticula increase both in size and in number; that fresh diverticula appear in fresh areas of the colon,[11] and that, while diverticula appear to be harmless at the moment, they might have been, or will become, the seat of inflammation.[12]

From the optimistic angle, patients who follow a medical regimen seldom require surgical treatment. Many patients with intestinal symptoms live in comparative comfort if they are careful about their diet, are regular at stool, take oil regularly and eliminate nuts and coarse, undigestible foods from their diet.[13]

Succinylsulfathiazole or phthalylsulfathiazole may also be helpful. On the other hand, 6 young patients whom I followed for periods varying from seven to twenty-one years, including the 3 operated on for perforation with abscess, stated that they took no special

3. Drueck, C. J.: Diverticula and Diverticulitis, Rev. Gastroenterol. **4**: 134 (June) 1937.
4. Mayo, W. J.: Diverticula of the Sigmoid, Ann. Surg. **92**: 739 (Oct.) 1930.
5. (*a*) Bennett-Jones, M. J.: Solitary Cecal Diverticula, Brit. J. Surg. **25**: 66-76 (July) 1937. (*b*) Thomsen, H.: Solitaere coecaldivtikler, Hospitalstid. **78**: 45 (Jan. 8) 1935.
6. Lynch, J. M.: Diverticula and Diverticulitis, J. A. M. A. **98**: 973 (March 19) 1932.
7. Erdmann, T. F.: Diverticulitis, New England J. Med. **223**: 848 (Nov. 21) 1940.
8. Bearse, C.: Acute Perforative Diverticulitis of the Colon in Young Persons, J. A. M. A. **113**: 1720-1722 (Nov. 4) 1939.
9. Brown, P. W.: The Treatment and Prognosis of Diverticulitis of the Colon, Am. J. Surg. **45**: 1162 (Oct.) 1939.
10. Bearse, C.: Diverticulosis and Diverticulitis of the Colon, Rev. Gastroenterol. **7**: 318-320 (July-Aug.) 1940.
11. Lockhart-Mummery, J. P.: Late Results in Diverticulitis, Lancet **2**: 1401 (Dec. 17) 1938.
12. Willard, J. H., and Bockus, H. L.: Clinical and Therapeutic Status of Cases of Colonic Diverticulosis Seen in Office Practice, Am. J. Digest. Dis. & Nutrition **3**: 580-585 (Oct.) 1936.
13. Brown, P. W., and Marcley, D. M.: Prognosis of Diverticulitis and Diverticulosis of the Colon, J. A. M. A. **109**: 1331 (Oct. 23) 1937. Friedenwald, J., in discussion on Brown and Marcley.

dietary precautions at all—in fact, they ate everything—and remained free of all intestinal symptoms. Be that as it may, it does seem that the younger the patient who has diverticulosis, the greater the need of starting prophylactic measures early in order to prevent diverticulitis and its undesirable sequelae.

SUMMARY

Diverticulosis and diverticulitis of the colon may be much more common in young persons than physicians have been led to believe. Statistics previously compiled are inadequate to portray the true incidence of these diseases in young persons. Failure to include diverticulitis in the differential diagnosis of abdominal conditions in young patients may result in unnecessary operations. Surgical intervention, when indicated, is usually because of perforation and abscess.

483 Beacon Street.

ABSTRACT OF DISCUSSION

DR. REGINALD FITZ, Boston: Dr. Bearse was kind enough to send me his manuscript several weeks ago and I read it with great interest. I thought his logic ingenious, but it seemed to me from what I had heard of diverticulitis and diverticulosis that he was presenting material both novel and rare. I consulted the Children's Hospital in Boston and I was informed that in that particular hospital, out of the total number of necropsies, which was large, no evidence of diverticulitis or diverticulosis had been encountered. Next I consulted the department of radiology and again was told that they had not recognized diverticulitis or diverticulosis by that method of study. Then I consulted the Peter Bent Brigham Hospital, where I worked for many years and where interest in radiology and the quality of work in the field is admirable. In the younger patients coming for examination no evidence of diverticulitis or diverticulosis had been observed; indeed I gathered that if one was to plot a curve of the incidence of these conditions they were recognized with increasing frequency as patients grew older. Diverticulitis and diverticulosis were commonly lesions of old people and not of children. Dr. Bearse has already reviewed this in his analysis of the literature. Finally it occurred to me that it would be interesting to get the point of view on the subject of an embryologist. I consulted an embryologist now interested in the pathology of infants and children. He said that there was good reason for believing that diverticulitis and diverticulosis in children would be encountered because of the embryologic development of the bowel, and I gathered that it was his idea that a certain number of them might suffer attacks from such lesions from which they might recover spontaneously as development continued or which might produce serious illness. Putting the whole thing together, I believe that Dr. Bearse has presented a very interesting paper. He has brought our attention to a disease in children that, if it is looked for, may be encountered more frequently than we have believed probable. On the whole, by drawing attention to it he has described a clinical picture worth looking for, which can be recognized and treated successfully by surgical means.

DR. CARL BEARSE, Boston: Diverticulosis and diverticulitis of the colon may be much more frequent than we think, and this applies to all age groups. Unless diverticulosis is thought of and a special search made for it in the course of a gastrointestinal x-ray examination, diverticula may not be found. The anteroposterior view is not always adequate; it may be necessary to take films in different planes, since there may be overlapping of the bowel at the flexures and in the pelvic colon. Diverticula may not show by barium enema unless the double contrast technic is used. Careful and repeated examinations are often necessary before diverticula can be demonstrated. As far as diverticulitis is concerned, the difficulties inherent in its clinical diagnosis and failure to recognize this condition at operation may explain in part at least the paucity of literature on diverticulitis of the colon in young people.

THE ENDOCRINE REGULATION OF CARBOHYDRATE METABOLISM

DeWITT STETTEN Jr., M.D., Ph.D.
New York

In the twenty-five years since the discovery of insulin, countless studies have been reported indicating one or another gross alteration in the metabolic processes of the diabetic animal and of the animal receiving insulin. Until relatively recently, however, those interested in the problem have despaired of finding a single valued, unitarian function of insulin, one particular operation that insulin performs in the animal that would account for the various observations in animals deprived of their physiologic source of insulin and in animals treated with insulin. Today there is a growing hope that the demonstration of such a single function is near at hand, and it is my purpose to indicate the nature of the evidence on which this hope is based.

The glucose of the body arises from several sources (see fig. 1). The first and major of these is the intestinal absorption of the products of carbohydrate digestion. The second, a process called glycogenolysis, has been shown to proceed from glycogen by an initial phosphorolysis which yields glucose-1-phosphate, and this product, in the body, rapidly comes into equilibrium with its isomer, glucose-6-phosphate. The next step, the hydrolysis of glucose-6-phosphate to give glucose, is governed by a specific phosphatase which, while abundantly present in liver, appears to be absent from muscle. It is this peculiar deficiency in muscle which prevents the generation of glucose directly from muscle glycogen. A third source of glucose is termed glyconeogenesis and under this heading I wish to include the formation of glucose from any and all noncarbohydrate precursors. Among these are the glucogenic amino acids, certainly glycerol and possibly fatty acids arising from fats and also products which have themselves arisen in the course of glucose catabolism. Essentially each step in the degradation of glucose-6-phosphate to carbon dioxide has now been shown to be reversible; hence, any of these degradation products or any material which may give rise to their formation is potentially glucogenic. As in the process of glycogenolysis, the liver has the necessary enzyme to effect the last step in glyconeogenesis, namely, the hydrolysis of glucose-6-phosphate to yield glucose.

It would be interesting to know the magnitudes of each of these contributions to the total glucose in man, but unfortunately such information is lacking. However, in the rat, employing the technic of isotopic tracers, approximate values for each of these fractions [1] have been arrived at which I give for what they are worth. Each day the rats ate 12 to 15 Gm. of carbohydrate; they generated only 0.4 to 0.5 Gm. of glucose by breakdown of glycogen, and they synthesized from

From the Department of Biochemistry, Columbia University College of Physicians and Surgeons.

Read before the Section on Internal Medicine at the Ninety-Fifth Annual Session of the American Medical Association, San Francisco, July 3, 1946.

The experiments of the author herein reported were carried out with the aid of grants from The Nutrition Foundation, Inc., and The Josiah Macy, Jr., Foundation.

The process of glycogenolysis is discussed by Cori, C. F., Cori, G. T., in Luck, M. J.: Annual Review of Biochemistry, Stanford University, Calif., Annual Reviews, Inc., 1941, vol. 10, p. 151.

For a discussion of the Embden-Meyerhof cycle and the Krebs tricarboxylic acid cycle, respectively, consult Meyerhof, O. (New England J. Med. **220**: 49, 1939) and Krebs, H. A. (Advances Enzymol. **3**: 191, 1943).

1. (*a*) Stetten, D., Jr., and Boxer, G. E.: J. Biol. Chem. **155**: 231, 1944. (*b*) Stetten, D., Jr., and Klein, B. V.: ibid. **159**: 593, 1945.

smaller fragments about 3 to 5 Gm. of glucose. In other words, of the total glucose supply approximately two thirds was of dietary origin, about one third resulted from glyconeogenesis, and only about 3 per cent arose by glycogenolysis.

In considering the fate of glucose in the animal, it should be pointed out that it is the present belief that this substance is to all intents and purposes metabolically inert unless it undergoes phosphorylation to

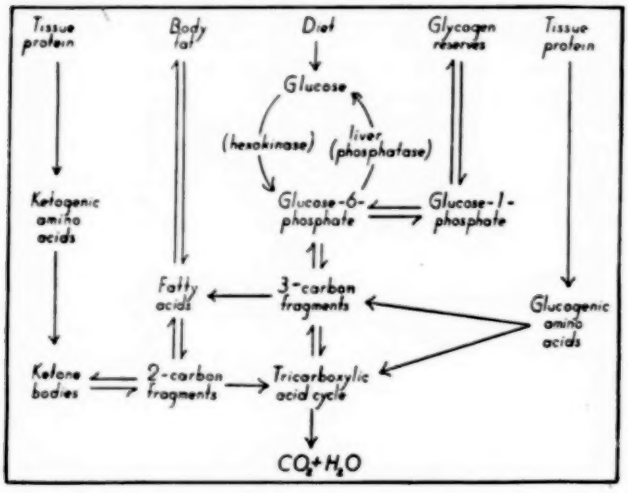


Fig. 1.—Fate of glucose in the body.

glucose-6-phosphate, a process catalyzed by the ubiquitous enzyme hexokinase (fig. 1). This reaction is not to be construed as a simple reversal of the previously mentioned hydrolysis of glucose-6-phosphate. A comparison of the formation of glucose-6-phosphate from glucose, on the one hand, and the formation of glucose from glucose-6-phosphate, on the other (fig. 2), reveals that, as written, both the reactions are energy-yielding and consequently essentially irreversible. In the synthesis of glucose-6-phosphate, catalyzed by hexokinase, adenosin triphosphate serves as the energy-rich source of phosphate, whereas in the breakdown of glucose-6-phosphate, catalyzed by liver phosphatase, it is inorganic phosphate that is liberated. Whereas hexokinase is present in almost every living cell, the phosphatase, as mentioned before, is absent from muscle.

Once glucose has been phosphorylated, many pathways are open to it (fig. 1). In the liver, glucose-6-phosphate may be split to regenerate glucose. In addition glucose-6-phosphate may be converted into glycogen by reversal of the same reactions by which glycogen is broken down. Furthermore, glucose-6-phosphate may enter the so-called Embden-Meyerhof cycle, to be broken down to pyruvate, lactate and other three-carbon fragments. A portion of these is utilized each day in the synthesis of fatty acids, a process we have called lipogenesis, and another portion is burned over the Krebs tricarboxylic acid cycle to give, ultimately, carbon dioxide and water. For want of time and space, the numerous other reactions known to occur have not been included in the present scheme.

Little is known of the magnitudes of these several fates of glucose in man. In the well nourished rat, it has been found[1a] that only about 3 per cent of the glucose ingested is converted each day to glycogen, while about 30 per cent is consumed in the manufacture of fatty acids. Glycogen, it will be observed, is in the nature of a cul-de-sac, like the vermiform appendix. The only route out is the reverse of the pathway in, and, at least in the rat, it is small in dimensions. In this species much more glucose is used each day to regenerate the fat depots than to replenish the glycogen stores of the body.

These several fates of glucose have been shown to be influenced by the level of insulin in the animal. Thus, in the diabetic animal, it has been shown that the conversion of glucose to pyruvate[2] is impaired. Although the diabetic animal continues to make glycogen, it makes it from small fragments rather than from glucose.[3] In addition it has been found that the rate of lipogenesis drops appreciably in the absence of a normal supply of insulin.[4]

Conversely, if insulin is injected into a normal animal, not only is glucose burned more rapidly, as indicated by the rise in the respiratory quotient, but also both glycogen and fatty acids are synthesized from glucose at a much higher rate.[4]

All these processes which are apparently influenced by insulin have one and only one common step, namely, that reaction catalyzed by hexokinase (fig. 1), and it is therefore gratifying that Cori and his collaborators have shown that the effect of insulin is indeed on this reaction. The St. Louis workers have demonstrated[5] in the anterior pituitary gland and in the humors of the body the presence of a specific inhibitor of hexokinase. When it is present in excess, this material retards the phosphorylation of glucose to glucose-6-phosphate which is normally catalyzed by hexokinase. Certain adrenocortical preparations prolong this inhibition of hexokinase without exerting any direct effect on hexokinase itself. Insulin, which likewise is without any direct action on hexokinase, serves to abolish this inhibition.

This elaborate hormonal control of hexokinase activity would be predicted to lead to the following effects. An excess of insulin would overcome the physiologic inhibition of the hexokinase reaction imparted by the anterior pituitary inhibitor. The phosphorylation of glucose would then proceed with undue rapidity, the level of blood glucose would fall and all the reactions of glucose-6-phosphate would be enhanced; that is, glycogenesis, lipogenesis and combustion would all be accelerated.

Conversely, an excess of anterior pituitary inhibitor or the lack of the physiologic supply of insulin which

$$\text{GLUCOSE} + \text{ADENOSINE TRIPHOSPHATE} \xrightarrow{\text{hexokinase}} \text{GLUCOSE-6-PHOSPHATE} + \text{ADENOSINE DIPHOSPHATE}$$

$$\text{GLUCOSE-6-PHOSPHATE} \xrightarrow{\text{phosphatase}} \text{GLUCOSE} + \text{INORGANIC PHOSPHATE}$$

Fig. 2.—Comparison of the formation of glucose-6-phosphate from glucose with the formation of glucose from glucose-6-phosphate.

normally antagonizes this inhibitor would be expected to result in impairment of the hexokinase reaction. Blocked at this step, the utilization of glucose would be slowed down in all its manifestations. Glucose would continue to arise from all its normal sources; the concentration of blood glucose would soon increase and

2. Bueding, E.; Wortis, H., and Fein, H. D.: Am. J. M. Sc. **204**: 838, 1942.
3. Stetten, D., Jr., and Boxer, G. E.: J. Biol. Chem. **156**: 271, 1944.
4. Stetten, D., Jr., and Klein, B. V.: J. Biol. Chem. **162**: 377, 1946. Stetten and Boxer.[3]
5. Price, W. H.; Cori, C. F., and Colowick, S. P.: J. Biol. Chem. **160**: 635, 1945. Cori, C. F., in The Harvey Lectures, 1945-1946, Lancaster, Pa., Science Press, 1946.

exceed the renal threshold. For the continuance of life, however, the main sequence of energy-yielding reactions must be kept in operation. If, consequent to the impairment of hexokinase activity, glucose is no longer available as a starting material, other bodily constituents would be expected to contribute to this sequence wherever possible. To this end, the reserves of glycogen and fat, and even the tissue proteins, would be drawn on, with a resultant fall in liver glycogen, tendency toward ketosis and negative nitrogen balance.

All these sequelae which would be expected from the action of insulin as described by Cori are in agreement with the facts observed. This agreement in itself suggests that perhaps the only important action of insulin in the body is to release the enzyme hexokinase from its physiologic inhibition. It is true that there are a few known effects of hypoinsulinism and hyperinsulinism that are not in accord with this concept. The most discussed of these is the anomalous and unexplained insulin sensitivity of the hypophysectomized animal. Undoubtedly the concept will suffer modification with the passage of time. At present, however, I feel that it is not overoptimistic to hold that the single, peculiar function of insulin may be close to elucidation.

ABSTRACT OF DISCUSSION

LIEUTENANT LAURANCE W. KINSELL (MC), U.S.N.R.: There are now available an ever increasing number of purified and synthetic hormonal substances of known composition and with known physiologic effects in terms of influence on protein, fat, mineral and carbohydrate metabolism. The actual mechanism of such effects is in most instances little or not at all understood. The postulation of stimulation or inhibition of specific enzyme systems by specific hormones had been favorably regarded in many quarters as the probable basic common denominator of such effects, but technics to evaluate this hypothesis become available rather slowly. Some years ago it was shown that epinephrine will stimulate glycogenolysis in vitro in the presence of macerated liver tissue. Dr. Stetten's findings and those of Cori and others definitely establish an inhibitory effect of certain hormonal substances derived from the anterior pituitary, as well as some of the adrenal cortical steroids on specific phosphorylating enzymes which are essential to the preoxidative phases of the carbohydrate cycle, and a neutralization of this effect by insulin. The hypothesis that this represents the only effect of insulin is most attractive and would be compatible with the majority of clinical and experimental observations with which we are familiar. There are however certain situations which may call for the postulation of additional specific insulin effects: The hypophysectomized animal and his clinical counterpart, the patient with panhypopituitarism or Simmonds disease, is notoriously insulin sensitive; i. e., a tiny dose of insulin is sufficient to cause a severe hypoglycemic reaction. If the only action of insulin were a neutralization of the so-called pituitary diabetogenic hormone one should obtain no insulin effect in such animals and patients. Second, I have recently seen a woman with the clinical counterpart of a "Houssay dog," namely hypoinsulin diabetes plus superimposed panhypopituitarism. In 1938 spontaneous, moderately severe diabetes mellitus developed requiring more than 50 units of insulin daily on an average diet. In 1942, following postpartum hemorrhage, panhypopituitarism, as described by Sheehan, developed. Despite the fact that the blood sugar remained above 300, she was thereafter unable to tolerate more than 1 or 2 units of insulin; larger dosage caused severe, typical hypoglycemic episodes, i. e. insulin shock to the point of actual convulsive seizures despite the fact that her blood sugar remained high. Two things appear obvious here: (1) that insulin increased the carbohydrate requirement of certain cells in the central nervous system and (2) that this demand could not be satisfied in the absence of anterior pituitary hormones despite the presence of a supernormal blood sugar.

DR. SAMUEL SOSKIN, Chicago: Dr. Stetten gave a clear, comprehensive outline of the consensus regarding carbohydrate metabolism in insulinism at the present time. It is gratifying that the biochemists are now confirming and becoming aware of what the physiologists have been doing for the last twenty years, and I think there is no great difference of opinion between the two; certainly the enzyme chemist has added a great deal to our intimate knowledge of what reactions are going on in the overall physiologic picture. I think it is agreed, and this is important from the clinical standpoint, that insulin does not act specifically on oxidation. It doesn't specifically act on the formation of glycogen but it acts to bring the sugar into the cell more rapidly for all purposes, and there can be little question from direct and indirect evidence that it acts through a phosphorylation process. Whether or not that phosphorylation process is the hexokinase reaction—in other words, whether it is at that point that insulin acts—I think is open to more question than indicated by Dr. Stetten, because his putting aside of the opposing evidence was a little bit like saying that the treatment was successful but the patient died. In this particular theory I think the contradictory evidence killed the theory. Cori showed that anterior pituitary extracts had an effect on the reaction. It is only when he uses anterior pituitary and insulin at the same time that he gets less. It will take much more experimental work to know, but if that were so, certainly as Dr. Kinsell mentioned, you would expect insulin not to have any effect on the animal in the absence of the pituitary, whereas it actually has a greater effect than in the normal animal. Until that question is answered, I am not willing to put it by as a side issue. I think it is the most important issue, and we must not assume that the problem of insulin is solved until it is answered.

Clinical Notes, Suggestions and New Instruments

TUBERCULOUS MENINGITIS TREATED WITH STREPTOMYCIN

LOUIS L. KRAFCHIK, M.D.
New Brunswick, N. J.

Cooke, Dunphy and Blake [1] first reported the use of streptomycin in tuberculous meningitis in a 1 year old infant. There was a favorable modification of the disease. Another 13 month old child was treated at a different hospital with massive doses of streptomycin. However, both patients were left with mental and organic nervous changes. The case reported herein is noteworthy because treatment was initiated early, and there has been complete clinical improvement.

REPORT OF CASE

A white boy aged 15 months was first seen at home on Jan. 15, 1946. There was a history of fever, irritability, restlessness and anorexia for six days. He had been treated by another physician with penicillin in beeswax given intramuscularly and with sulfadiazine given by mouth, but without apparent result. Examination revealed a rather thin child who appeared ill. The temperature was 103 F., the respiratory rate 28 and the pulse rate 120. There were a few white patches on hypertrophied tonsils. A diagnosis of follicular tonsillitis was made, and the child was given a mixture of caffeine, acetylsalicylic acid and acetophenetidin. He seemed to improve for a few days, and then the symptoms recurred. He was again seen January 21, at which time his temperature was 103 F., and he appeared acutely ill. He was extremely restless, and bit his hands continuously. Examination revealed slight nuchal rigidity and hyperactive knee jerks. On admission to the hospital for observation, his past history included pneumonia at 8 months of age. He was an only child. The

From the Department of Pediatrics, St. Peter's General Hospital.

1. Cooke, R. E.; Dunphy, D. L., and Blake, F. G.: Streptomycin in Tuberculous Meningitis: A Report of Its Use in a One Year Old Infant, Yale J. Biol. & Med. **18**: 221, 1946.

maternal grandmother, who visited the child often, was treated for pleurisy at a tuberculosis hospital.

The blood count disclosed: 4,180,000 red blood cells, 78 per cent hemoglobin and 23,150 white blood cells, with 65 per cent polymorphonuclear leukocytes, 30 per cent lymphocytes and 5 per cent monocytes.

Urinalysis was essentially negative. A spinal tap was performed and showed: normal pressure; a ground glass appearance; 440 cells per cubic millimeter, 84 per cent lymphocytes, 16 per cent polymorphonuclear leukocytes; sugar, 15 mg. and chlorides, 460 mg. per hundred cubic centimeters, and a positive Levinson test. A pellicle formed on standing, and a direct smear revealed acid-fast bacilli.

A diagnosis of tuberculous meningitis was made, and after a two day delay streptomycin therapy was started on Jan. 24, 1946.

The intramuscular dose was calculated on the basis of 20,000 units per pound (0.5 Kg.) of body weight per twenty-four hours; i. e. 62,500 units every three hours. At the same time 25,000 units was given intrathecally twice a day. After four days the intrathecal dose was increased to 50,000 units twice a day, or a total of 600,000 units a day by the combined routes. This was maintained for seventeen days, when the intramuscular dosage was decreased to 50,000 units every three hours. This dosage was maintained for another seventeen days, and then it was gradually reduced until it was stopped, fifty-seven days after treatment began. He received a total of 24,000,000 units intramuscularly and 2,800,000 units intrathecally (65 spinal taps).

He ran a low grade febrile course varying from 99 to 101.5 F. for over seven weeks. The nuchal rigidity persisted for approximately five weeks and then gradually disappeared. During the first two weeks there developed a positive Brudzinski sign, but this soon disappeared. The deep tendon reflexes which at first were hyperactive became depressed and finally normal. At one stage of the disease the abdominal reflexes were absent. One convulsive seizure on February 4, two weeks after admission, lasted a short time. At no time did the patient lose consciousness. Approximately five weeks after entry, all his neurologic signs had disappeared, and the child was able to stand in his crib and to walk around with support. A tuberculin patch test on February 2 was very strongly positive. Thirty-two days after the initiation of streptomycin therapy it was discontinued because the supply was temporarily exhausted. The temperature then rose above 102 F., so therapy was resumed within two days.

On March 6, forty-two days after treatment was started, there developed a thick, dry, gray-white membrane over both tonsils. Smears and cultures yielded a fungus. The child was given 40,000 units of penicillin in conjunction with the streptomycin, and a severe generalized urticarial reaction developed in an hour. Penicillin was stopped, and sulfamerazine was given without response. The membrane persisted until gentian violet medicinal was used locally.

On March 14, fifty-two days after admission, there suddenly developed a definite, tender swelling of the right parotid gland, without an unusual rise in temperature. This disappeared in three days and did not involve the opposite side.

Interestingly enough, the child's cousin had the same thing, i. e., a bilateral parotid gland swelling without fever, almost a week later. The patient's mother visited the cousin's home daily. It is believed that they both had the mumps.

The accompanying table shows a representative number of spinal fluid observations. Unfortunately a guinea pig was inoculated with the patient's spinal fluid only after treatment with streptomycin had been started. When the guinea pig was killed six weeks later, there were no signs of tuberculosis. This experiment was subsequently repeated three times with the same results.

Roentgenograms of the chest showed hilar gland enlargement, especially on the right side. Subsequent plates disclosed little change. The roentgenographic diagnosis was tuberculous hilar lymphadenitis.

The child was discharged on March 27, 1946; he walked with little support, there was no elevation in temperature, and there were absolutely no neurologic abnormalities. During the first month at home there was a slight afternoon rise in temperature, up to 100.3 F. rectally. At present, five months after the onset of the illness, the child is clinically well. The temperature has been normal for seven weeks, and he is active and mentally normal. The last spinal fluid examination (May 28) still shows a pleocytosis without any other abnormality. Repeated roentgenograms of the chest reveal little change in the hilar gland enlargement.

Data on Examinations of Cerebrospinal Fluid

	Date									
	Jan. 22	Jan. 24	Jan. 28	Feb. 11	Feb. 18	Feb. 26	March 2	March 13	April 2	May 28
Cell count	440	839	400	78	384	410	265	110	50	110
Lymphocytes, %	84	95	Most	65	Most	Most	78	86	Most	Most
Polymorphonuclear leukocytes, %	16	5	.....	45	.....	.....	22	14	.....	.....
Sugar, mg. per 100 cc.	15	18.5	.....	35	37	58	58	.....	50	66
Globulin	+++	.....	.....	+++	.....	+++	++++	+++	.....	.....
Chlorides, mg. per 100 cc.	460	.....	600	680	680	.....	670	.....	720	.....
Pellicle formation	Yes	Yes	.....	Yes	Yes	.....	Yes	Yes	.....	.....
Levinson test	Positive	.....	Positive	Positive	Positive	.....	.....	.....	.....	.....
Smear	Acid-fast bacilli	.....	Negative	Negative	Negative	.....	Negative	.....	Negative	.....
Culture	Negative	.....	Negative	Negative	Negative	.....	Negative	.....	Negative	.....
Guinea pig inoculation for tuberculosis	.....	.....	Negative	.....	.....	.....	Negative	.....	Negative	.....

COMMENT

Tuberculous meningitis is believed by most observers to be a uniformly fatal disease, especially in young infants. There are approximately 60 cases reported in the literature which ended in cure. However, in many of them the authenticity of the diagnosis is questionable.

In the case reported here there was a history of contact, a positive tuberculin test and hilar gland enlargement. Examination of the cerebrospinal fluid gave characteristic chemical and cytologic data, and smears on admission showed acid-fast bacilli. However, the guinea pig inoculation was negative for tuberculosis. Unfortunately, the animal was not inoculated until two days after streptomycin therapy was started. It is conceivable that enough of the drug was in the spinal fluid to inhibit the growth of the organism in the guinea pig. This action of streptomycin in guinea pigs was demonstrated by Feldman, Hinshaw and Mann.[2]

In the case reported by Cooke, Dunphy and Blake,[1] a guinea pig inoculated with the patient's spinal fluid before therapy was started was positive for tuberculosis. After streptomycin therapy began, 6 other pigs were subsequently inoculated with spinal fluid from the patient. Necropsy failed to reveal evidence of tuberculosis in any of them.

SUMMARY

In a case of tuberculous meningitis, a 15 month old child who was treated with streptomycin obtained complete clinical recovery.

158 Livingston Avenue.

2. Feldman, W. H.; Hinshaw, H. C., and Mann, F. C.: Streptomycin in Experimental Tuberculosis, Am. Rev. Tuberc. 52: 269, 1945.

CLINICAL APPLICATIONS OF CHICK EMBRYO CULTURES

III. Adaptation for Use by the General Practitioner in Bacteriologic Diagnosis of Clinical Problems

HENRY K. SILVER, M.D.
and
C. HENRY KEMPE, M.D.
San Francisco

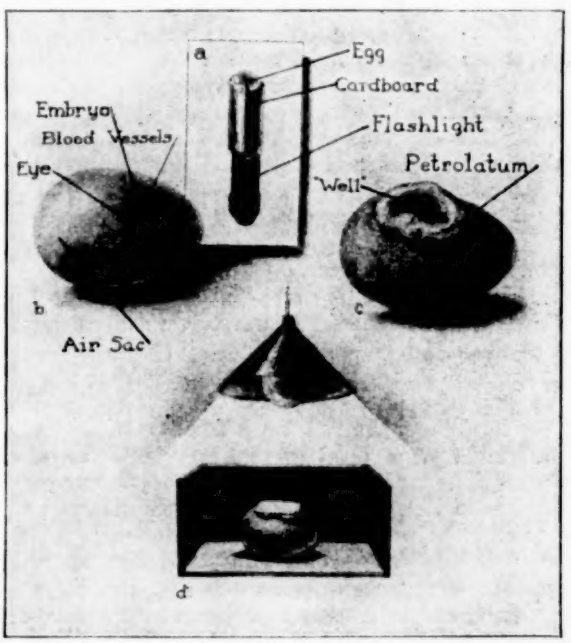
The physician who practices in a small town or in a rural area that is without laboratory facilities frequently is unable to arrive at a clearcut bacteriologic diagnosis in his clinical problems because fresh and sterile culture mediums are not readily available. Culture mediums, including agar plates and slants, take considerable time to prepare, and they require sterilization and use within a short period to avoid drying and contamination. Infrequent need for conventional mediums may make their use uneconomical and impractical for the rural practitioner. On the other hand, in most rural areas he can easily obtain a fertile hen's egg, and this presents him with a sensitive culture medium in a suitable sterile container which is ready for immediate use in a variety of clinical problems, including the identification of the causative organisms of purulent infections of the skin, otitis media and empyema.[1] It is also of use for the culture of spinal fluids in suspected cases of meningitis,[2] and of cultures taken from any operative site. Several simple modifications of the technic pioneered by Goodpasture and his associates[3] enable the practitioner to grow pathogenic organisms rapidly, inexpensively and with a minimum of bacteriologic equipment.

METHOD

A hen's egg that has been incubated for five to ten days (either under the hen or in a commercial incubator) is candled to determine the viability of the embryo. This may be done by holding the egg at the open end of a cone of cardboard or heavy paper placed over a flashlight (fig. 1*a*). The viable embryo is seen as a dark spot with a radiating network of blood vessels (fig. 1*b*). If the embryo has died it and the area surrounding it become uniformly dark, and no blood vessels can be seen. The area on the shell overlying the embryo and over the air sac (which usually lies at the rounded end of the egg) are marked with a pencil. Next, a circle is made with petrolatum on the shell over the embryo (fig. 1*c*); the "well" that is formed should be approximately ¼ to ⅜ inches high and have a diameter of about ½ inch. Into this "well" several drops of a half-strength concentrated nitric acid solution are placed. The action of the acid on the shell results in the appearance of a foam. A drop of the diluted acid also is placed at the air sac end of the egg. After four to five minutes the acid is washed off with sterile water.

After the acid has been removed, a probe or needle is inserted for a distance of a few millimeters through the thinned area of the shell over the air sac. Next, the softened shell within the petrolatum ring is lifted off gently. Care is taken not to injure the shell membrane lying directly underneath. A drop of sterile water is placed on this white membrane and a slit is made in it with a scalpel or sterile needle. This allows the underlying vascular embryonic membranes to fall away from the shell membrane, which then can be removed without difficulty with forceps. The preparation of the window is completed now, and the egg is ready for use as a culture medium. With a little practice the above steps are accomplished with ease and rapidity.

Looking down into the window that has been made, the embryo is seen to be lying about ⅜ inch below the shell surface, and up to 2.5 cc. of the fluid to be examined can be dropped directly through the window. Only small quantities of pus, spinal fluid or empyemic fluid are required, and in many instances as little as 0.1 cc. suffices. After the material to be tested has been added, the egg is resealed by covering the window with a coverglass that has been sterilized by passing it through a flame. Incubation at a temperature between 98.6 F. and 103 F. is accomplished in an incubator or, when one is not available, by placing the egg in a cardboard box and suspending an ordinary 100 watt light bulb 8 inches above the egg (fig. 1*d*). By regulating the distance between the lamp and the egg, the temperature can be maintained uniformly at the desired level.



Preparation of fertile egg for use as a culture medium; *a*, method of candling; *b*, appearance of transilluminated egg that has been incubated for six days; *c*, making the "well" with petrolatum, and *d*, method of incubating egg if an incubator is not available.

After five to eight hours of incubation the coverglass is lifted off, and a sterile wire loop is touched to the moist surface of the embryo. The material that is obtained is stained by the Gram method and examined microscopically for the presence of organisms. If no organisms are found at this time the coverglass is replaced, and the egg is reincubated and reexamined twenty-four to forty-eight hours after inoculation. Most cultures will be positive at five to eight hours and almost all within twenty-four hours. Excellent growth of meningococci, hemolytic streptococci, staphylococci, pneumococci and Hemophilus influenzae can be obtained from clinical specimens, and direct and prompt typing of the latter organisms is possible.

SUMMARY

A simple modification of the Goodpasture chick embryo culture method has been described, which lends itself to use by the rural practitioner to whom artificial mediums are not readily available. With the chick embryo as a culture medium, it becomes relatively simple to identify the causative organisms of various diseases, such as purulent infections of the skin, otitis media and empyema. It can also be used for the culture of spinal fluid in suspected cases of meningitis and for the culture of material taken from any operative site.

From the Department of Pediatrics, University of California Medical School, and Children's Hospital.

Dr. Francis S. Smyth of the Department of Pediatrics, University of California Medical School, cooperated in this work.

Aided by grants from the Rosenberg Foundation and from the Fleishner Endowment Fund for the Study, Prevention and Treatment of Communicable Diseases in Childhood.

1. Kempe, C. H.; Shaw, E. B., and Silver, H. K.: Clinical Applications of Chick Embryo Cultures: I. Primary Diagnosis of Meningitis and Study of Spinal Fluid in Meningococcemia Without Meningitis; II. In Vivo Streptomycin Sensitivity Test, Am. J. Dis. Child., to be published.

2. Blattner, R. J.; Heys, F. M., and Hartmann, A. F.: Advantages of Egg Culture Technic in Infectious Diseases, Arch. Path. **36**: 262 (Sept.) 1943. Kempe, Shaw and Silver.[1]

3. Woodruff, A. M., and Goodpasture, E. W.: The Susceptibility of the Chorio-Allantoic Membrane of Chick Embryos to the Infection with the Fowl-Pox Virus, Am. J. Path. **7**: 209, 1931. Goodpasture, E. W.: Use of Embryo Chick in Investigation of Certain Pathological Problems, South. M. J. **26**: 418, 1933. Goodpasture, E. W., and Buddingh, G. C.: The Preparation of Antismallpox Vaccine by Culture of the Virus in the Chorio-Allantoic Membrane of Chick Embryos, and Its Use in Human Immunization, Am. J. Hyg. **21**: 319, 1935. Goodpasture, E. W., and Anderson, K.: The Problem of Infection as Presented by Bacterial Invasion of the Chorio-Allantoic Membrane of Chick Embryos, Am. J. Path. **13**: 149, 1937.

Council on Physical Medicine

The Council on Physical Medicine has authorized publication of the following report. An article having the same title was published in THE JOURNAL *on July 21, 1934, page 183 and on July 28, 1934, page 254. It has been revised several times and later was included in the "Handbook of Physical Medicine." The ensuing article is a complete revision of the former and in addition has been brought up to date. It includes the most recent information available to the Council on this subject.*

HOWARD A. CARTER, *Secretary.*

SOURCES OF ULTRAVIOLET AND INFRA-RED RADIATION USED IN THERAPY

Physical Characteristics

W. W. COBLENTZ, Ph.D., D.Sc.
Washington, D. C.

When an object is heated to a higher temperature than its surroundings, an excess of infra-red rays passes from it to the surrounding objects. Examples of sources of infra-red rays are arc lamps, incandescent lamps, coal fires, steam pipes and hot stoves. Because of their low temperature, the infra-red rays emitted by hot water bags and electrical heating pads are of low intensity, and hence they are insignificant in comparison with the amount of heat that is obtained by conduction, by having the hot pad or hot water bottle in contact with the body. Of course it sounds more impressive to speak of infra-red rays than to speak of the application of heat by conduction, by direct contact of the pad with the body.

There is nothing new or mysterious about the ultraviolet and the infra-red rays. A person is always exposed to the infra-red rays when standing near a steam radiator, an open grate fire or even an electric toaster. The spectral quality and total intensity of the infra-red rays emitted by the electric radiant heaters for warming rooms are essentially the same as those emitted by the infra-red lamps sold for therapeutic purposes. The main difference is that the latter have more elaborate adjustable mountings and consequently cost more money.

During the past few years, experimental data have become available showing that the spectral band of ultraviolet radiation of wavelengths shorter than about 3,150 angstroms,[1] occurring in sunlight and in some artificial sources of radiation, if sufficiently intense and if the time of exposure is sufficiently prolonged, has the power of preventing and of curing rickets. This is the underlying basis for exploiting the ultraviolet radiation of these wavelengths for general healing purposes. While this point of view may be too broad, the beneficial effects of short wavelength ultraviolet radiation in surgical tuberculosis and certain skin diseases is recognized.

PHYSICAL PROPERTIES

Before I discuss the various types of sources of radiation available for therapeutic purposes, it will be instructive to consider several incidental questions that enter into the subject. In fact, in order to apply radiation therapy successfully, it is important to have a thorough understanding of the physical properties of the source of thermal radiation as well as of the physiologic reaction of living matter on exposure to it. Successful thermal radiation therapy depends on a knowledge of the spectral quality of the source, the total quantity or intensity and the time of exposure, which depends on the distance of the patient from the lamp.

Except for the question of intensity and wavelength, physically there is no definite distinction between the various regions of the spectrum called "ultraviolet," "visible" and "infra-red." Chemically and physiologically there is a distinct difference. The action of infra-red rays is thermal and instantaneous, producing a burning sensation when the intensity is too great. They are nonspecific as to wavelength. On the other hand, the ultraviolet rays are biologically specific as to wavelength and cause, among other effects, the coagulation and precipitation of albumin. Their action is slow and insidious, so that the effect is not perceived until from three to six hours after exposure. A short exposure to an innocent looking carbon or mercury arc may produce severe conjunctivitis. Hence the eyes should be protected with deep brown glasses or covered with a black cloth to prevent their injury when the body is being irradiated.

Although there is no sharp demarcation of these rays into wavelength bands, for convenience I shall indicate these spectral ranges (table 1) and mention some of the photochemical and physiologic effects, if known. The wavelengths may be written in angstroms, microns ($\mu = 0.001$ mm.) or millimicrons ($m\mu$); i. e., wavelength 3,000 Å $= 0.3\ \mu = 300\ m\mu$. Thus the ultraviolet emission line of the quartz mercury vapor arc lamp, frequently mentioned in this paper, is 2,967 angstroms, 0.2967 microns or 296.7 millimicrons. More complete data on the radiation from arc lamps [2] and on their germicidal action [3] are given in other publications.

TABLE 1.—*Different Spectral Regions, Probable Depth of Penetration and Probable Physiologic Action of Rays from Different Sources**

Spectral Region	Penetration of Rays	Physiologic Action	Source
Far ultraviolet 1,800 to 2,900 Å	Superficial 0.01 to 0.1 mm.	Photochemical	Metals in carbon arc and spark of metals (mercury arc)
Near ultraviolet 2,900 to 3,900 Å	Superficial 0.1 to 1 mm.	Photochemical	Sun; metals in carbon arc; arc of metals
Visible spectrum 3,900 to 7,600 Å	Deep 1 to 10 mm.	Thermal; nerve stimulation	Sun; carbon arc
Near infra-red 7,600 to 15,000 Å	Deep 10 to 1 mm.	Thermal; nerve stimulation	Sun; carbon arc; gas-filled tungsten lamp and carbon filament incandescent lamp
Far infra-red 15,000 to 150,000 Å	Superficial 1 to 0.05 mm.	Thermal; nerve stimulation	Carbon arc; infra-red (radiant) heaters

* Wavelengths in angstroms, Å.

1. *Depth of Penetration of Thermal Radiation.*—Authorities differ regarding the transparency of the skin, muscles, tendons, and the like and, hence, regarding the depth to which radiation of different wavelengths can penetrate into the body.

Recent transmission measurements seem to indicate that the depth of penetration is not so great as formerly supposed. Furthermore, with increased knowledge of radiation therapy, less emphasis is being placed on this question.

Depth of penetration is a relative term, whether one means penetration to a depth where the intensity

1. The angstrom unit of wavelength is one ten-millionth millimeter.

2. Coblentz, W. W.; Dorcas, M. J., and Hughes, C. W.: Radiometric Measurements on the Carbon Arc and Other Light Sources Used in Phototherapy, Bur. Stds. Sc. Papers **21**: 535, 1926.

3. Coblentz, W. W., and Fulton, H. R.: A Radiometric Investigation of the Germicidal Action of Ultra-Violet Radiation, Bur. Stds. Sc. Papers **19**: 641, 1924.

is reduced to 1/10 or 1/10,000 of the incident radiation; and this, in turn, depends on the threshold of the biologic effect sought, such as photochemical action or temperature sensation.

For example, when a flashlamp is placed in the mouth, in the palm of the hand or against the inside of the wrist and viewed in the dark, the cheeks, the frontal sinuses, the back of the hand and the outside of the wrist glow with a reddish light, showing that the light of the lamp, somewhat modified by selective absorption in the short wavelengths and much reduced in intensity (and diffused over a much wider area than the part illuminated), has traversed a thickness of from 5 to 40 mm.

Spectral transmission measurements on samples of different thicknesses of skin are in agreement with similar measurements on more homogeneous samples of other proteins, showing great opacity to ultraviolet radiation of wavelengths shorter than about 3,000 angstroms and to infra-red radiation of wavelengths longer than about 25,000 angstroms (beyond which wavelength water also is very opaque), so that in neither case can an appreciable amount of radiation penetrate to a depth greater than about 0.05 to 0.1 mm. Nevertheless, the ultraviolet rays can produce a photochemical action on substances in the skin and thereby have a specific healing value.

On the other hand, so far as is known, the effect of infra-red radiation is entirely thermal. Recent studies of temperature sensation by Oppel and Hardy [4] show that nonpenetrating infra-red radiation of long wavelengths is the most stimulating. This probably explains why discomfort is sometimes experienced when one is exposed to certain types of heaters which emit an excessive amount of nonpenetrating infra-red radiation.

The part of the spectrum to which the skin is relatively transparent (but in which there appears to be no specific biologic action other than nerve stimulation) extends from about 5,000 angstroms to 12,000 angstroms, with a wide maximum of transparency in the region of 7,000 to 9,000 angstroms.

This is the spectral region of "penetrating radiation," the depth of penetration depending on the nature of the underlying material (tendon, blood vessels, muscle), as for example, the irradiated hand whose back, as already mentioned, shows a reddish glow and dark shadows of the superposed blood vessels.

According to Oppel and Hardy,[4] the more penetrating the rays the less sensitive the subject is to them. However, the amount of irradiation, even with penetrating wavelengths, that can be tolerated by the skin is rather low, so that this form of internal heating is different from that produced with diathermy machines. By irradiating the body with a source emitting a large amount of penetrating radiation Laurens and Foster [5] observed a measurable increase in temperature (about 1 C. [1.8 F.] at a depth of 15 mm. below the surface) above that attained when exposed to an equal amount of nonpenetrating infra-red radiation.

Data on the depth of penetration of radiation into the skin are given in table 1. It is, of course, to be understood that small amounts of radiation penetrate to still greater depths than those indicated and that these values represent limits in depth at which effective biologic action (if any) may still be expected. In the dehematized skin the depth of penetration would be greater than under normal conditions.

2. *Reflectors and Windows.*—In view of the fact that most lamps used for therapeutic purposes are provided with reflectors and windows, it is relevant to emphasize the fact that the mirror acts solely as a reflector of the rays that fall on it and does not itself contribute anything additional to the ultraviolet radiation emitted by the source. In fact, since the reflector absorbs more of the short wavelength ultraviolet than of the visible and infra-red rays, especially when the surface is composed of a powdered metal (for example, aluminum) which has been applied with a lacquer, the total amount of ultraviolet radiation in proportion to the visible and the infra-red rays is relatively lower in the reflected rays than in those that proceed directly from the source. The reflector, placed back of the source, simply increases the total amount of radiation of all wavelengths falling on an object placed in front of the lamp. The reflector cannot supply ultraviolet wavelengths that may be lacking in the source, and after it becomes covered with smoke from the arc, the amount of reflected radiation is greatly reduced.

Likewise windows or filters used in front of the source of ultraviolet radiation, whether it is the sun, the mercury arc or the carbon arc, emit no ultraviolet wavelengths themselves but always reduce the intensity of the rays that are present. The same is true of lacquers used in applying the powdered metal for a reflecting surface. Linseed oil and cellulose lacquer are highly opaque to ultraviolet radiation of wavelengths shorter than 3,500 angstroms.

3. *Radiant Heat Versus Conducted Heat.*—In view of the general misconceptions on this subject, it is relevant to call attention to the difference in heat transfer by conduction and by radiation. Practically all the heat obtained from an electrically operated heating pad or a hot water bottle (which takes the place of a heated brick or flaxseed used in the earlier days), placed in contact with the body, is transferred by thermal conduction. The amount obtained in the form of infra-red rays is negligibly small.

SOURCES OF RADIATION

Under the caption of sources of radiation various types of thermal radiators are considered, beginning with those operated at low temperatures and therefore emitting principally infra-red rays. In order to obtain an appreciable amount of ultraviolet radiation it is necessary to heat the radiating substance to a high temperature, 3,000 C. (5,432 F.) or higher. Since solids (e. g., metals such as tungsten) evaporate rapidly at high temperatures, sources of ultraviolet radiation are practically confined to electric arcs between electrodes of metals, of carbon and of mercury vapor in a closed tube of quartz or suitable glass.

1. *Miscellaneous Sources.*—The miscellaneous sources of radiation comprise vacuum incandescent lamps, kerosene lamps, acetylene flames, luminous and Bunsen gas flames and incandescent mantles heated by gas flames, which do not emit sufficient ultraviolet radiation to be useful in therapy. Neither is the ultraviolet emitted of sufficient intensity to be a source of injury to the eye. Incandescent lamps have been built into cabinets used for treatment by means of infra-red rays. Wood and coal fires in an open grate emit practically no ultra-

4. Oppel, T. W., and Hardy, J. D., Jr.: Studies in Temperature Sensation; Comparison of the Sensation Produced by Infra-Red and Visible Radiation, J. Clin. Investigation **16**: 517 (July) 1937.

5. Laurens, H., and Foster, P. C.: The Effect of Artificial Radiant Energy on the Tissue Temperature Gradient in Men of Different Skin Colors and After Artificial Pigmentation, Am. J. Physiol. **118**: 372 (Feb.) 1937.

violet radiation but are good sources of infra-red rays, which will become less and less familiar to coming generations. The open front gas stove, with its incandescent radiant of refractory clay, cannot be operated at a sufficiently high temperature to emit an appreciable amount of short wavelength ultraviolet rays. It is a convenient source of intense infra-red radiation, giving a spectral energy distribution that is somewhat similar to curve B in chart 1. However, care should be taken to avoid the production of carbon monoxide which results from improperly adjusted gas burners and insufficient ventilation.

2. *Infra-Red Radiators.*—Under the heading of infra-red radiators may be placed various radiant heaters used for therapeutic purposes. They consist of a concave reflector at the focus of which is an incandescent filament lamp in a glass bulb, or a heater consisting of an electrically heated solid rod, or a resistance wire embedded in or wound on an electrically nonconducting refractory material such as, for example, steatite, lava or porcelain. The color of the surface (whether white or black) is unimportant. The nonmetallic surface emits the greatest amount of infra-red rays.

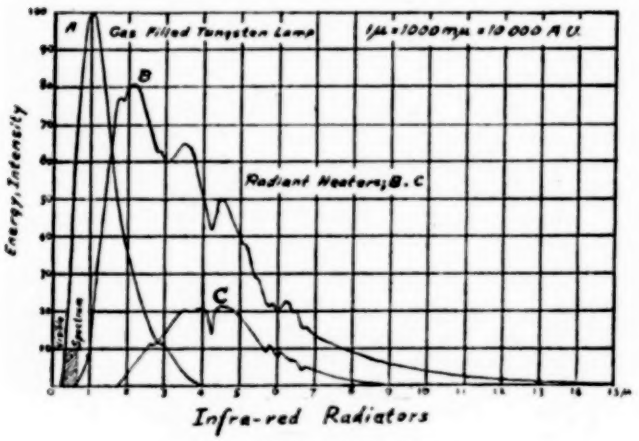


Chart 1.—Infra-red radiators.

The incandescent tungsten and carbon filament radiators that are enclosed in glass bulbs emit radiation of wavelengths 4,000 to 40,000 angstroms (chart 1), with the maximum emission at from 11,000 to 20,000 angstroms, depending on the temperature of the filament. Only a small amount of radiation is emitted by the glass bulb.

The radiant heaters that are not enclosed in glass emit perceptible radiation of all wavelengths throughout the infra-red to 150,000 angstroms (15 μ), beyond which point the intensity is very low, as shown in chart 1. The carbon dioxide and water vapor in the air selectively absorb certain wavelengths in the infra-red, producing indentations in the spectral energy curves, especially at 4.2 microns (42,000 angstroms). With increase in temperature the maximum emission shifts toward the short wavelengths, so that for a surface temperature of from 300 to 400 C. (572 to 750 F.) the maximum emission (curve C, chart 1) is not well defined, extending from 4 to 5 microns (40,000 to 50,000 angstroms), whereas at a low red heat (from 600 to 800 C., or 1,112 to 1,472 F.) the maximum emission becomes more sharply defined (curve B, chart 1) and lies between 2 to 3 microns (20,000 to 30,000 angstroms). Moreover, the infra-red radiation from the latter is far more intense (eight to ten times greater) than that emitted by the heater at 300 C. (572 F.).

The reflectors surrounding these heaters are practically nonselective; hence they have no appreciable effect in modifying the spectral composition of the radiation emanating from the heater. In other words there is no way of producing narrow spectral zones of radiation by emission in the infra-red. On the other hand, filters for isolating relatively narrow bands of the visible and ultraviolet are easily provided.

For experimental purposes, the most easily produced, fairly narrow band of infra-red radiation is obtainable from the Bunsen nonluminous gas flame, which has a strong emission band at 4.4 microns (44,000 angstroms), but the total intensity is rather low.

A filter consisting of a cell of water and red glass will confine the radiation stimulus to the spectral region extending from 6,000 to 14,000 angstroms. The red glass alone will confine the stimulus to wavelengths between 6,000 and 40,000 angstroms. Such a filter may be used in front of a Mazda gas-filled tungsten lamp as a source of infra-red rays.

3. *The Tungsten Filament Lamp.*—The newest type of infra-red radiation consists of a tungsten filament inclosed in a conical shaped gas-filled glass bulb that screws into an ordinary lamp socket. The reflector consists of a thin sheet of aluminum deposited on the inside of the conical shaped part of the bulb. It is an inexpensive source of infra-red radiation. On rare occasions fluctuations in line voltage (or other undetermined causes) may melt the tungsten filament, and the bead of molten metal may fall on the glass bulb, causing it to explode. Hence, if the lamp is to be operated directly above a person it should be covered with a wire screen, for example, inexpensive flyscreen. Severe burns from such lamps, especially ultraviolet ray lamps, may ensue from overexposure due to falling asleep during irradiation.

The Mazda CX tungsten filament lamp, enclosed in a bulb of special glass that transmits ultraviolet at wavelengths extending from 2,800 to 3,100 angstroms (recognized as effective in preventing rickets) has been considered for a source of ultraviolet radiation. Calculations and radiometric measurements show that the tungsten filament even when enclosed in a bulb that transmits the ultraviolet rays extending from 2,800 to 3,100 angstroms, emits but little ultraviolet radiation of these wavelengths.

A small lamp, similar in appearance to the automobile headlight lamp, was on the market some time ago. It was operated at a considerably higher voltage than that normally used, which shortened its useful life to a few hours. It was claimed that under these conditions the lamp would emit sufficient ultraviolet radiation for therapeutic purposes. The lamps examined did not emit an appreciable amount of ultraviolet rays of wavelengths less than 3,100 angstroms.

In curve A on chart 1 is depicted the relative spectral energy distribution of the radiation from the gas-filled tungsten lamp. The maximum emission occurs at 10,600 angstroms (1.06 μ in the illustration). The measurements were made on a 1,500 watt gas-filled lamp, but without a reflector such as is used in a therapeutic lamp. The reflector would increase the total intensity in the direction observed. The bulb, which is of clear glass, absorbs practically all the radiation of wavelengths longer than 35,000 angstroms and it absorbs completely all the radiation of wavelengths greater than 45,000 ang-

stroms. The low temperature radiation from the heated glass bulb (some 11 per cent of the total) cannot penetrate deeply into the skin.

The gas-filled tungsten lamp is useful as a source of visible and short wavelength infra-red radiation of wavelengths less than 15,000 angstroms. About 30 per cent of the total radiation emitted by the gas-filled tungsten lamp is of wavelengths that can penetrate deeply into the skin. The original papers cited here [6] contain data on the spectral energy distribution of the tungsten filament in a gas-filled bulb.

A recent production that is still in an experimental stage of development is a tungsten filament in a gas-filled bulb of black glass that freely transmits the infra-red rays and absorbs the visible rays, thus reducing the glare of the intense light. In another design a deep red or black glass filter is placed in front of the above mentioned conical shaped tungsten filament lamp (with an aluminum reflector on the inside) that screws into an ordinary lamp socket.

4. *The Violet Ray Lamp.*—One of the standard products of commerce is an incandescent lamp consisting of a helical carbon filament in a bulb of blue glass, sold for decorative purposes and sources of low illumination in assembly rooms. If such lamps have a therapeutic effect, e. g., in stimulating the growth of hair on bald heads, it should be noticeable on patrons of amusement houses. Nevertheless such lamps have been put into special caps and sold for growing hair and for therapeutic purposes.

Radiometric tests showed that the intensity of the violet and ultraviolet rays emitted by such a lamp is only one ten-thousandth the total radiation emanating from the lamp. The amount of violet and ultraviolet rays of full sunlight transmitted through the glass bulb of such a lamp was from 1,000 to 1,500 times greater than that of the carbon filament lamp. Observations showed that the intensity of the violet rays of sunlight (skylight) falling on the scalp of a person sitting near a window, but not in direct sunlight, would be from 50 to 150 times that of a blue carbon filament lamp.

Another bit of hokum is a so-called violet ray lamp consisting of a spark coil to which is attached a glass tube that terminates in a flattened glass bulb, which emits a blue glow when it touches the body. The function of this glass tube is to provide a high resistance to the electric current that comes from the spark coil, so that the patient will not feel the shock too severely. Even if the ultraviolet rays generated could pass through the glass walls of the bulb, they would be too weak in intensity to be effective for therapeutic purposes.

5. *The Nickel and the Tungsten Arc.*—The radiation emitted from the arc vapors between two electrodes of nickel, and of tungsten consists of numerous fine lines which (chart 2) are not separated when examined with a small spectroscope.

The spectral energy distribution of the arc between two pure nickel rods 12 mm. in diameter, with tapered ends, operated on 6 amperes, is given in chart 2, from which it may be noted that the nickel arc emits strongly at 230 millimicrons (2,300 angstroms) and especially at 350 millimicrons (3,500 angstroms). These bands are especially conspicuous in certain cored carbons, discussed in a subsequent part of this paper. The arc nickel-cored carbons is an excellent source of ultraviolet radiation. Moreover, the material is inexpensive, quiet burning and easy to operate.

The tungsten rods examined were 6.4 mm. in diameter and were the regular imported British stock material used for therapeutic purposes. They were operated on 5 amperes. Because of the formation of a crust of oxide around the electrode, the arc was rather unsteady and consequently difficult to operate. The emission spectrum of tungsten is weak in the spectral region of wavelengths shorter than 2,300 angstroms (230 mμ in chart 2).

The odors from the metal arcs are disagreeable, and some vapors may be irritating to the bronchial tubes. In order to eliminate the odors and to secure greater steadiness in operation cored carbon electrodes containing oxides of certain metals are commonly used in place of electrodes of pure metals.

6. *The Sun.*—In connection with the following discussion of the radiation emitted by artificial sources, it is relevant to mention the sun—the only natural source available for therapeutic purposes. The temperature of the surface of the sun is above 5,500 C. (9,932 F.), some estimates being 6,000 C. (10,832 F.). The solar radiation intensity, falling on a surface normal to the incident rays in this latitude (38° 50′) at sea level at the noon hour on a clear day, amounts to about 1.2

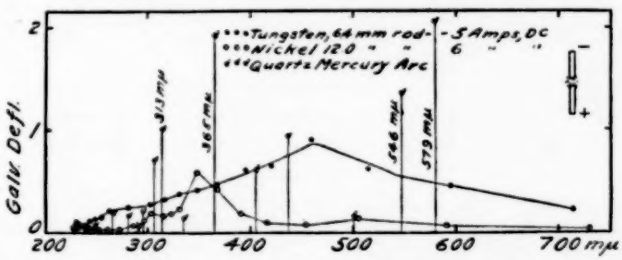


Chart 2.—Spectral energy (intensity, galvanometer deflections) distribution of the radiation emitted by the arc between electrodes of nickel, of tungsten and of mercury vapor in a quartz tube called "the burner."

gram calories per minute per square centimeter and rarely rises to 1.35 gram calories. Less than 0.1 per cent of this amount is ultraviolet of wavelengths that have a strong therapeutic action, at least in preventing rickets.

The intensity of the ultraviolet rays varies greatly with the altitude above sea level (chart 3) and also with the time of day. Only between the hours of 9 a. m. and 3 p. m. (excepting in the three summer months, when it is least needed) is this ultraviolet component of sufficient amount to be of importance radiometrically, and probably therapeutically. In addition to this variation with the time of day, the amount of vitalizing ultraviolet solar rays available for therapeutic purposes varies with the season of the year, with the altitude and the geographic latitude of the station, and with the almost infinite variety of air pollution and weather conditions that are encountered in different localities.

The intensity of the shortest ultraviolet solar rays transmitted by the atmosphere is extremely small. The intensity at 2,900 angstroms is only one millionth as great as at 3,132 angstroms, where the mercury arc has a strong emission line, and only about one forty-millionth of the intensity of the sun's rays in the visible spectrum, where the intensity is a maximum (chart 3).

7. *The Carbon Arc.*—As already mentioned, the temperature of the surface of the sun is about 5,500 C.

6. Coblentz, W. W.: Emissivity of Straight and Helical Filaments of Tungsten, Bur. Stds. Sc. Bull. **14**: 115, 1917. Priest, I. G.: Measurements of the Color Temperature of the More Efficient Artificial Light Sources by the Method of Rotary Dispersion, Bur. Stds. Sc. Papers **18**: 225, 1922.

(9,900 F.). The temperature of the positive electrode of the carbon arc is much lower or about 3,300 C. (6,000 F.) The carbon arc is the hottest artificial source of radiation readily obtainable, and in this respect it is the closest approach to sunlight. However, the radiation from the carbon arc is far from being like

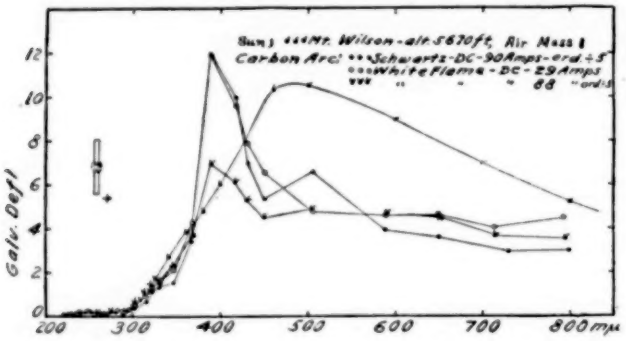


Chart 3.—Spectral energy (intensity) distribution of the sun and of the carbon arc.

sunlight. There is a strong emission band in the violet at about 3,890 angstroms (the "cyanogen band," chart 3), and beyond 40,000 angstroms in the infra-red there is a great amount of radiation not present in sunlight. When a window of special glass (e. g., Corex-D) is used, which shuts out the ultraviolet rays of wavelengths shorter than 2,900 angstroms and longer than 40,000 angstroms, the spectral limits are similar to those of sunlight; but the intense cyanogen band remains.

Except for the violet cyanogen band at 3,890 angstroms, the vapors from the electrodes of pure carbon are nonluminous. A highly luminous arc is produced with carbons filled with various substances.

Superimposed on the radiation from the arc vapors is the continuous spectrum from the highly incandescent crater of the positive electrode. The result is an intense infra-red spectrum, of wavelengths longer than the solar rays transmitted by the atmosphere. If the arc is surrounded by a glass or a quartz globe, as already mentioned, some of the infra-red rays are excluded; but in turn the surrounding globe becomes heated and emits nonpenetrating infra-red rays with wavelengths of from 50,000 to 120,000 angstroms which are not present in sunlight. Hence, no exact comparison can be made between the radiation from the sun and that from the carbon arc.

The crater of the positive electrode emits an intense white light, which, as already mentioned, is mixed with the radiation of the arc vapors. This fact is usually overlooked in discussions of the radiation from the carbon arc. The vapors from the pure carbon arc contribute only a small amount of the total radiation emitted.

In chart 3 is shown the distribution of energy in the ultraviolet and in the visible spectrum of the sun (as observed on Mount Wilson) and of the white flame carbon arc. For convenience in making these comparisons, the radiation intensities (the galvanometric deflections) of the sun and of the carbon arc were set to equality at 300 millimicrons (3,000 angstroms), a procedure that is permissible and in common use.

No appreciable radiation of the sun of wavelengths less than 2,900 angstroms is transmitted by the earth's atmosphere. On the other hand, radiation of wavelengths out to 2,200 angstroms is observable in the white flame carbon arc. As illustrated in chart 3, the ultraviolet cyanogen band, with its maximum emission at 389 millimicrons (3,890 angstroms), is relatively far more intense than similar wavelengths in the spectrum of the sun. On the other hand, under the same conditions the radiation of the sun in the visible spectrum is relatively far more intense than that of the white flame carbon.

As will be mentioned presently, the radiation from the mercury vapor arc in a quartz burner consists of a series of strong emission lines, notably at 2,537, 2,660, 2,804, 2,967, 3,024, 3,132, 3,342 and 3,663 angstroms. In this spectral region the radiation from the vapors of the carbon arc consists of numerous fine lines, which are so close that the spectrum appears continuous and, hence, somewhat like that of sunlight.

When the carbon arc is enclosed with a close fitting transparent quartz chimney, the gases surrounding the arc expand and force sufficient air out of the chimney to establish an equilibrium in pressure; viz., atmospheric pressure. The amount of oxygen is reduced and the life of the electrode is prolonged. When the arc is extinguished cold air rushes in. This does not mean, however, that the arc was operating under reduced pressure; i. e., in a partial vacuum. The pressure was the same as or slightly above the atmospheric pressure, but the volume of oxygen (air) was reduced.

In some recent designs of carbon arc lamps the arc is partly surrounded by a metal casing, which reduces the circulation of air and prolongs the life of the electrode.

Factors Affecting Carbon Arc Radiation: It has been found that the radiation from the carbon arc depends on (1) the size and the kind of the electrodes (white flame, blue flame, yellow flame, red flame, chart 4); (2) the direction of the current when direct current is used through combinations of neutral cored and impregnated carbons, and (3) the amount of the electric current.

This information has been of assistance in making improvements in arc lamps. Assuming that the manufacturer has incorporated into his lamp the latest improvements based on the information available regarding the proper current, the proper size of electrode for a given current and the direction of the current (if direct current) through the electrodes, it is incumbent

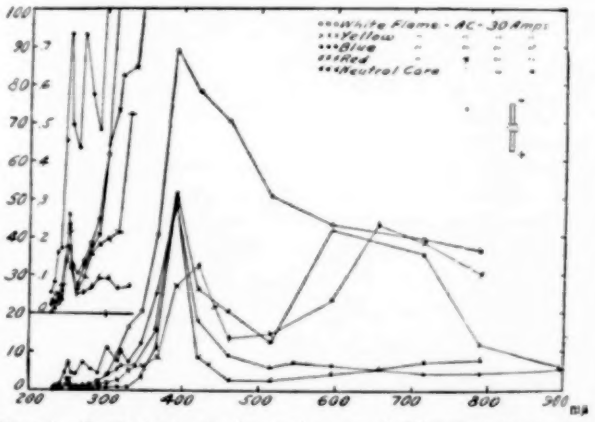


Chart 4.—Spectral intensity (energy) curves of different kinds of carbon electrodes.

on the purchaser of such a lamp to operate it as was intended. This is evident from the increase in the intensities (thermopile-galvanometer deflections) of the different wavelengths with increase in the current (hence the temperature) in the arc (chart 5). Take, for example, the curve of intensities for the wavelength 3,024 angstroms, which is of special interest because of its strong antirachitic action. On 5 amperes the gal-

vanometric deflection is hardly perceptible. With a current of 30 amperes, the intensity (galvanometric deflection) is almost a hundred times greater.

As a general rule, high amperage arcs are more efficient than the low amperage arcs in the production of ultraviolet and visible radiation, relative to the total infra-red radiation produced. All carbon arcs emit considerable nonpenetrating infra-red radiation of wavelengths longer than 40,000 angstroms not present in sunlight. Aside from the production of a sensation of warmth, there is probably no important physiologic reaction that could not be produced by the above described, simpler sources of infra-red radiation.

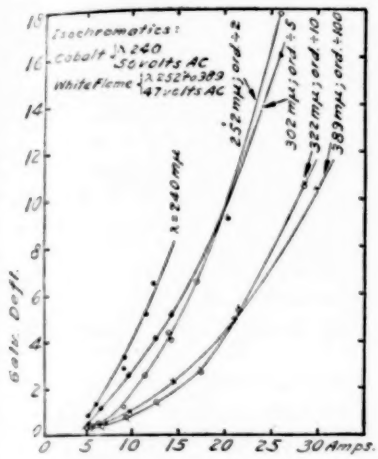


Chart 5.—Increase in intensities of the emission lines in the carbon arc with increase in current.

Data on the radiation from the carbon arc have been published elsewhere.[7] Hence, it will be sufficient to depict the spectral energy distribution of representative samples of cored carbons containing substances that in the state of incandescent vapor have bands of selective emission in certain parts of the spectrum. These spectral energy curves throughout the ultraviolet, the visible spectrum from 390 to 750 millimicrons (3,900 to 7,500 angstroms) and to 800 millimicrons (8,000 angstroms) in the infra-red spectrum, are illustrated in chart 4. The inset on the left-hand side of chart 4 gives a magnified (ten times) illustration of the intensities extending from 250 to 300 millimicrons.

The effect of direct current is to raise the temperature of one electrode considerably higher than the average that occurs when alternating current is used. This increases the intensity of the cyanogen band at 3,890 angstroms, especially in the blue flame arc, but it does not have so pronounced an effect on the intensity of the radiation in the short wavelength ultraviolet and in the visible spectrum.

Kind of Electrodes: It may be noticed (chart 4) that in the neutral core carbon arc (a practically pure carbon) the ultraviolet radiation of wavelengths less than 320 millimicrons (3,200 angstroms) is extremely weak, the radiation being concentrated almost entirely in the cyanogen band, with a maximum at 389 millimicrons (3,890 angstroms). In contrast, in the blue flame (therapeutic B) carbon arc, the ultraviolet radiation of wavelengths less than 310 millimicrons (3,100 angstroms) exceeds that of all the other arcs illustrated (chart 4).

In the yellow flame (therapeutic D) carbon arc there is considerably more radiation, extending from 2,900 to 3,200 angstroms (290 to 320 mμ in the illustrations) in the ultraviolet, which is weak in the neutral core carbon arc. In the visible spectrum there is a strong emission extending from 5,000 to 7,000 angstroms.

The red flame (therapeutic E) carbon arc is conspicuous for its intense emission, extending from 5,500 angstroms in the orange to beyond 7,500 angstroms in the red.

The white flame (therapeutic A) carbon arc is conspicuous for its relatively low spectral emission in the ultraviolet of wavelengths shorter than 2,900 angstroms and its high emission in the region extending from 4,500 to 5,000 angstroms, which is lacking in the other carbon arcs just described. Owing to the intense radiation in the cyanogen band at 3,890 angstroms (chart 3), the color of the light emitted by the white flame carbon is a more bluish white than sunlight. However, as already mentioned, when the arc is covered with a suitable glass chimney which absorbs the ultraviolet rays shorter than 2,900 angstroms and the infra-red rays longer than 40,000 angstroms, the white flame carbon arc is the closest approach to sunlight. But it is still far from being an exact match with sunlight in spectral energy distribution. It remains to be determined whether this difference in spectral energy distribution is of importance biologically.

8. *The Quartz Mercury Arc.*—In recent times the electric arc discharge through mercury vapor under different conditions of pressure and temperature is being used in a variety of sources of ultraviolet and visible fluorescence radiation. The radiation from the mercury arc in a quartz or suitable glass tube called "the burner" is emitted principally in a series of intense spectral lines (charts 2, 6 and 7) superposed on a faint continuous spectrum that contributes little to the total ultraviolet emanating from the arc.

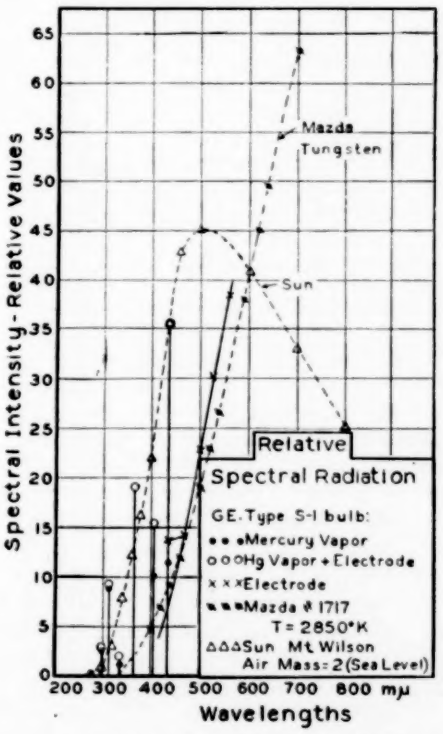


Chart 6.—Relative spectral radiation.

Recently a number of new types of mercury arc lamps have been put on the market. They serve two purposes: (1) those which emit a high ultraviolet intensity, for therapeutic purposes; and (2) the so-called sunlamps which emit ultraviolet radiation similar in biologic effectiveness to that of sunlight in the wave band at 2,900 to 3,200 angstroms and emit practically no radi-

7. Coblentz, W. W.: Spectral Characteristics of Light Sources and Window Materials Used in Therapy, Tr. Illum. Engin. Soc. **23**: 247 (March) 1928. Coblentz, Dorcas and Hughes.[2]

ation of wavelengths shorter than 2,800 angstroms, for home use without the supervision of an experienced physician.

The Hot Quartz Lamp: The earliest and best known type of quartz mercury arc lamp (the so-called "hot quartz" lamp) operates at a high vapor pressure and a relatively high temperature. The current through the lamp is fairly large (from 3 to 4 amperes) and the voltage on the burner is low (from 65 to 70 volts).

Investigations [8] of quartz mercury arc lamps having (1) a solid tungsten anode and (2) a liquid mercury anode show that there is no appreciable difference in the ultraviolet component radiation emitted by these two types of lamps when operated on the same energy input in the burner. Air-cooled burners operated on alternating current (through the burner) and water-cooled burners operated on direct current appear to have a somewhat higher ultraviolet radiation component than air-cooled, direct current burners, owing to the lower temperature of the lamp.

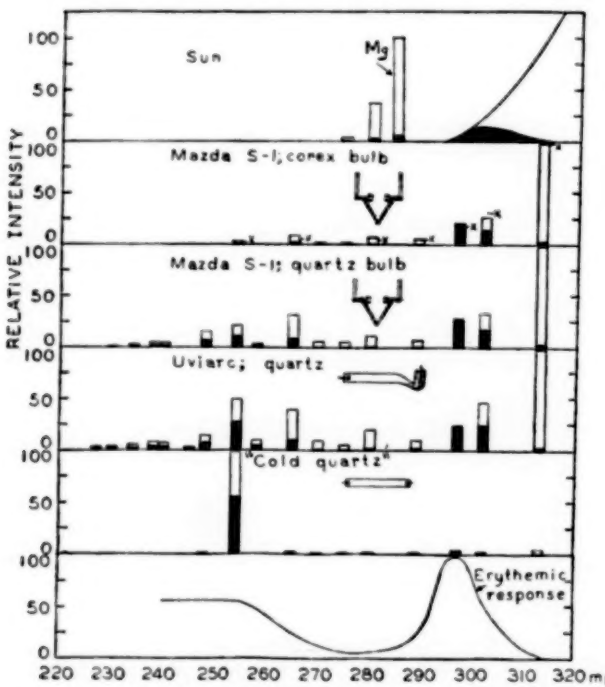


Chart 7.—Ultraviolet spectral energy distribution of various sources; also spectral erythemic response curve of the untanned skin. The unshaded areas represent intensities of individual emission lines; the dark areas represent the relative effectiveness of each line in producing an erythema.

A recent development is a mercury arc lamp operated on alternating current in which both (Wehnelt) electrodes are of activated metal. The burner, of quartz or thin Corex-D glass, contains only a small amount of mercury which is completely vaporized. The emission spectrum is typical of the ("hot quartz") neutral mercury atom.

Aside from several strong emission lines in the region of 10,000 to 12,000 angstroms, the quartz mercury arc emits but little infra-red radiation.[9] The infra-red rays that are emitted emanate principally from the incandescent tungsten anode and especially (in both types of lamps) from the quartz enclosure and the hood, which emit low temperature, long wavelength and nonpenetrating radiation. To provide warmth a combination of mercury arc and gas-filled tungsten lamps are available.

Physically there is no comparison between this type of radiation and that of the sun (chart 7), and it is hardly to be expected that these two sources will give the same results in all types of light treatment and in dye fading.

In chart 7 is given the spectral energy distribution (unshaded vertical lines) of a 110-volt Uviarc lamp operated on 65 volts, and about 4 amperes in the burner. Owing to the high current density, the temperature and the pressure are relatively high, and the resonance emission line at 2,537 angstroms is practically of the same intensity as the lines at 3,024 and 3,132 angstroms, in contrast with the so-called "cold quartz" vapor glow lamp (chart 7), in which the line at 2,537 angstroms contains over 95 per cent of the radiation emitted by these three lines.

The Mazda Sunlight Lamps: A modification of the "hot quartz" mercury arc (the Mazda S-1 and the Mazda S-2 sunlight lamps) is a combination of an incandescent tungsten filament and an arc in mercury vapor between highly incandescent electrodes of tungsten. This is accomplished by operating a V-shaped helical tungsten filament in parallel with the mercury arc, but it is at a considerably lower temperature than the incandescent tungsten electrodes forming the arc at the top of the V-shaped filament.

The type S-1, S-2, and S-4 mercury arc lamps must be used on the proper type of transformer to produce the electrical characteristics required for starting and operating these lamps.

The surrounding globe, of Corex-D glass, absorbs the rays of wavelengths shorter than 2,800 angstroms which are not present in sunlight. The mercury arc supplements the ultraviolet radiation, which is only feebly emitted by the incandescent tungsten electrodes, at from 2,800 to 3,650 angstroms. The result of this combination of incandescent solid and arc-vapor radiation is an unusual emission spectrum, consisting of a series of strong ultraviolet emission lines of mercury vapor (at 2,804, 2,967, 3,024, 3,132, 3,342, 3,663 and 4,078 angstroms, chart 6), superposed on a continuous spectrum radiation from the incandescent solid, which increases rapidly in intensity (beginning to be perceptible at about 3,650 angstroms) and extends throughout the visible and into the deep infra-red (charts 1 and 6).

Another production is the type S-4 lamp, operated on alternating current. This lamp consists of a high intensity mercury arc between activated tungsten electrodes, in a quartz capillary tube that (with a small ballast resistance) is inclosed in a glass bulb which absorbs the rays of wavelengths shorter than about 2,800 angstroms. To increase the intensity the type S-1, S-2, and S-4 sunlamps are mounted in suitable reflectors.

The Type RS Sunlamp: The newest self-contained sunlamp consists of a high pressure mercury arc in a quartz capillary tube which, with an incandescent tungsten ballast resistance and a reflector, is sealed in a conical shaped glass bulb that screws into an ordinary lamp socket. No auxiliary transformer or ballast resistance is required. The bulb is of special glass that is opaque to wavelengths shorter than 2,800 angstroms. The mercury arc, incandescent tungsten filament and aluminum reflector on the inside of the conical shaped glass bulb provide an inexpensive source of ultraviolet

8. Coblentz, W. W.; Long, M. B., and Kahler, H. K.: The Decrease in Ultraviolet and Total Radiation with Usage of Quartz Mercury Vapor Lamps, Bur. Stds. Sc. Papers **15**: 1, 1918. Coblentz, W. W., and Kahler, H. K.: A New Spectropyrheliometer and Measurements of the Component Radiations from the Sun and from a Quartz Mercury Vapor Lamp, Bur. Stds. Sc. Paper's **16**: 233, 1920.

9. Coblentz, W. W.: Selective Radiation from Various Substances, IV., Bur. Stds. Sc. Bull. **9**: 81, 1912.

radiation similar to the S-4 lamp, combined with infrared similar to the S-1 lamp.

The Cold Quartz Lamp: The so-called "cold quartz" ultraviolet lamp is essentially a low vapor pressure, low amperage (0.015 ampere), high potential (5,000 volts, open circuit) glow discharge, similar to the well known Geissler tube. The power consumed is small and consequently there is no great rise in temperature of the burner.

The spectral energy distribution of this type of ultraviolet lamp is illustrated in chart 7. Of the total radiation of all wavelengths shorter than and including the line at 3,132 angstroms, more than 95 per cent is contained in the resonance emission line of mercury vapor at 2,537 angstroms. Two models of this type of lamp were examined—a small grid hand lamp in an aluminum reflector and a large hexagonal grid lamp in a large aluminum reflector, supported on a stand for body irradiation.

In recent times this type of low vapor pressure mercury arc in a special glass tube that is opaque to radiation shorter than 2,300 angstroms (to reduce the generation of ozone by shorter wavelengths) is being promoted for disinfecting purposes.[10]

The Fluorescent Sun Lamp: A recent development is a fluorescent lamp containing a phosphor that emits ultraviolet radiation in the band of wavelengths at 2,900 to 3,500 angstroms. The opacity of the glass envelope prevents the passage of the powerful emission (fluorescence-exciting) line at 2,537 angstroms. The fluorescence spectrum is essentially continuous with superposed emission lines of mercury.[11]

The Type G Mercury Glow Lamp: By providing suitable ionization by means of electrons emitted from a hot cathode, only a relatively low voltage is required to excite resonance radiation in the glow discharge through mercury vapor. A typical example of this type of radiation (which is still in an experimental stage of development) is an ultraviolet glow lamp, in a pear-shaped bulb of special glass that absorbs almost completely all the ultraviolet rays of wavelengths shorter than about 2,800 angstroms. The operating temperature of this type of lamp is low, and the glow discharge practically fills the glass bulb.

The spectral energy distribution of this type of mercury vapor radiation is somewhat similar to that of the Mazda S-1 lamp in a Corex-D glass bulb, illustrated in chart 7. Since the total ultraviolet emitted by this type of lamp is of wavelengths longer than 2,900 angstroms, it belongs to the category of sunlamps.

The High Frequency Electrodeless Discharge: Another type of ultraviolet therapeutic lamp is the electrodeless discharge through mercury vapor, in a spherical bulb. The lamps examined were spherical bulbs of quartz, or Corex-D glass (without electrodes), which are placed within a helical conductor that carries the high frequency current obtained from the transformer of a diathermy machine. The bulb is evacuated and contains a globule of mercury, the vapor of which is excited to luminescence by means of the high frequency discharge from the 5,000 volt secondary of the transformer, passing through the helix surrounding the bulb. It is well known that the emission spectrum of the electrodeless discharge is essentially that of the neutral mercury atom, similar to that of the ordinary mercury arc, though close to the walls of the bulb there are some weak spark lines not present in the hot quartz mercury arc lamp.

The spectral energy distribution, the total ultraviolet output and the erythematogenic efficiency of this type of lamp were found to be nearly the same as those of the ordinary mercury arc lamp (Uviarc) depicted in chart 7. Practically the only difference is the intrinsic brightness (flux density) which, in the ordinary quartz mercury arc, is concentrated in a luminous column less than 10 mm. in diameter, whereas in the electrodeless discharge the radiation fills the entire bulb, some 6 to 8 cm. in diameter.

Recently an electrodeless mercury arc discharge tube (of quartz, about 15 cm. long; 1.5 cm in diameter) energized by radio frequency and consuming about 20 watts was foisted on the public. The ultraviolet radiation emitted was chiefly of wavelength 2,537 angstroms. The intensity was only about one-sixth the minimum requirement for acceptance by the Council on Physical Medicine (table 2; "cold quartz").[12]

9. The Cold Red Light.—But few sources of radiation remain unexploited for therapeutic purposes. A recent European production is a so-called cold red light emitted by the neon glow discharge tube, familiar to all in the form of the sign-lighting tubes in show windows and street signs. The intensity of the total radiation emitted by the neon glow lamp is low. It consists of a narrow band of wavelengths in the orange-red part of the spectrum with a maximum in the region of 6,500 angstroms and a weaker maximum at about 8,500 angstroms. Neon emits practically no radiation of wavelengths longer than about 10,000 angstroms.[9] If the deeply penetrating rays in the red and near infra-red have a specific therapeutic action, it would be more efficient to use an intenser source of these rays. For example, a powerful source of red and near infra-red rays is a 500 watt gas-filled tungsten filament lamp described previously herein. If the narrow band of red and near infra-red rays has a specific therapeutic action only when it is used separately from the rest of the spectrum of the tungsten lamp, it can be isolated by placing in front of the lamp a filter consisting of a sheet of red glass to shut out the shorter wavelenths and a cell of water or a sheet of Corning heat-absorbing glass to intercept the infra-red rays of wavelengths longer than about 10,000 angstroms. The maximum of the filtered radiation will be in the spectral region of about 7,000 to 8,000 angstroms, with an intensity that far exceeds the ordinary neon glow lamp. From the clinical tests made by Cramer and Fechner[13] with a neon glow lamp intended for therapeutic purposes, it appears that the cold red ray lamp has little, if any, specific stimulating effect on the human body.

10. Black Light Ultraviolet Lamps.—The fluorescence excited by filtered ultraviolet radiation is finding a wide variety of uses by amateurs and by professional workers in examining minerals and documents as well as in theatrical entertainments and the like; also in the examination and diagnosis and as a guide in the treatment of ringworm infection of the scalp. The source of ultraviolet is a high vapor pressure, "hot" mercury arc lamp. The filter enclosure consists of a red-purple glass that transmits principally the powerful emission

10. Acceptance of Ultraviolet Lamps for Disinfecting Purposes, J. A. M. A. **118:** 298 (Jan. 24) 1942.
11. Reports on The Chemical World Today, Indust. & Engin. Chem. **38:** 14-16 (June) 1946.
12. Sun-Kraft Cold Quartz Ultraviolet Ray Therapy Lamp Not Acceptable, J. A. M. A. **122:** 505 (June 19) 1943; **130:** 493 (Feb. 23) 1946.
13. Cramer, H., and Fechner, G.: Clinical Tests of Skin Reaction to Cold Red Light (Neon), Strahlentherapie **39:** 474, 1931.

line of wavelength 3,663 angstroms and a less amount of the emission line of 4,055 angstroms.

These emission lines can excite a hazy white fluorescence ("fog") in the eye media that interferes with clear vision and causes discomfort if proper precautions are not taken; suitable glasses should be worn.[14]

BIOLOGIC EFFECTS

This survey of the ever increasing number of types of lamps sold for therapeutic purposes, some of which are so weak in ultraviolet radiation that an exposure of from ten to thirty hours would be required to produce a minimum perceptible erythema, seems incomplete without some reference to their use.

As noted previously, during the past few years experimental data have become available which show that the spectral band of ultraviolet radiation of wavelengths shorter than about 3,150 angstroms occurring in sunlight and in some artificial sources of radiation, if sufficiently prolonged, has the power of preventing and of curing rickets. This is the underlying basis for exploiting ultraviolet of these wavelengths for general healing purposes. Whether this point of view is too broad remains to be determined.

An important unanswered question is the minimum ultraviolet radiant flux (radiant power) that the source must emit in order to insure effective therapeutic action. Manifestly, the amount of ultraviolet radiation that can be applied to the body without producing a burn depends on the tolerance of the skin. This can be measured by the erythema produced. It is common knowledge that the erythemal sensibility of the untanned skin is widely different for different persons and also widely different for the same person, depending on the amount of moisture on the skin. Hence, the erythemic response is in common use as an indicator of skin tolerance and of the amount of ultraviolet radiation that can be applied at any one time. Furthermore, in view of the wide variation in ultraviolet output of different kinds of lamps, and the wide variation in skin tolerance (twice as sensitive in summer as in winter), the safe procedure is to test the erythemal reaction on a small area of each person before attempting to make exposures over large areas of the body.

Since most of these sources emit a wide band of ultraviolet radiation in the spectral region that produces an erythema (shown in the lower part of chart 7), the purpose of the erythema test is to avoid burns. The erythema test is not necessarily a measure of the therapeutic action of the lamp, although, in the case of rickets, the spectral bands of erythemal and therapeutic action appear to overlap. However, if a source should be obtained having a strong emission at from 2,700 to 2,900 angstroms with little or no radiation at 2,500 and 2,967 angstroms (indicated by the emission lines marked "Mg" in the upper part of chart 7), a far stronger dosage could be applied, without producing a burn, than with lamps now in use. But it remains to be determined whether it would be more effective biologically than the sources (lamps) now used.

In view of these considerations[15] the Council on Physical Medicine of the American Medical Association has adopted[16] and, until a more practical procedure is proposed, will use the erythemal reaction as a basis for judging the effectiveness of ultraviolet lamps for two important reasons: (1) In the case of exposure to intense sources of ultraviolet radiation it is a simple and practical means of preventing severe burns, and (2) in the case of weak sources of ultraviolet radiation it is an efficient safeguard against possible fraudulent sale of lamps that are deficient in ultraviolet radiation.

The Council's specifications of minimum intensity are based on a comfortable and convenient operating distance (24 inches, or 61 cm.) from the front edge of the reflector, at which distance the exposure can be made without burning the skin by contact with the burner or by the infra-red rays. The ultraviolet intensity of the lamp shall be such that the time of exposure to produce a minimum perceptible erythema (one that disappears in less than twenty-four hours) will not be longer than fifteen minutes for a therapeutic lamp and sixty minutes for so-called sunlamps.

TABLE 2.—*Erythematogenic Equivalents of Heterogeneous Ultraviolet Radiation from Various Sources, Relative to 20 Microwatts per Square Centimeter of Homogeneous Radiation of Wavelength 2,967 Angstroms, Required to Produce a Minimum Perceptible Erythema*

Source	Microwatts per Square Centimeter
Sun: midday, midsummer, midlatitude, sea level	91
Carbon arc: blue flame, cored carbon, in reflector, no window	48
Carbon arc: glass window, opaque to 2,800 angstroms and shorter (estimated)	90 *
Mercury arc: Mazda, type S-1 lamp; high temperature arc in parallel with V-shaped tungsten filament; in glass bulb	83 *
Mercury arc: Mazda, type S-2 lamp; similar to the S-1 lamp, but smaller; in glass bulb	93 *
Mercury arc: quartz capillary; type S-4 and RS; in glass bulb	80 *
Mercury arc: type G-5; low temperature, low voltage thermionic glow discharge; glass bulb	108 *
Mercury arc: high temperature, high vapor pressure, low voltage; quartz tube	58 *
Mercury arc: high frequency electrodeless discharge; quartz bulb	60
Mercury arc: low temperature, low vapor pressure, high voltage, "cold quartz." Geissler tube discharge	36

* Lamps marked with an asterisk are acceptable as sunlamps.

The spectral erythemic response of the untanned skin to an equal energy stimulus is shown in the lower part of chart 7. From this it can be seen that the emission line of the mercury arc lamp at 2,967 angstroms (297 mμ in the illustration) has an erythematogenic efficiency of 100 per cent relative to the rest of the spectral erythemic response. No other wavelength or group of wavelengths has such a high efficiency in generating an erythema. Hence, the emission line of homogeneous radiation at 2,967 angstroms is a natural standard for evaluating sources of heterogeneous ultraviolet radiation.

The intensity and the erythematogenic action of the emission line of mercury at 2,967 angstroms is easily evaluated in absolute units; and the erythemal action, as well as the radiometric output, of the heterogeneous ultraviolet radiation from various sources is readily correlated with this emission line as a standard (table 2).[17]

From our experiments[17] it appears that a fifteen minute exposure to a flux density of 20 microwatts

14. Eye Discomfort Caused by Improperly Shielded Black Light Ultraviolet Lamps, J. A. M. A. **131:** 287 (May 25) 1946.
15. Coblentz, W. W.: Ultraviolet Radiation Useful for Therapeutic Purposes, J. A. M. A. **98:** 1082 (March 26) 1932; **99:** 125 (July 9) 1932.
16. Acceptance of Sunlamps, J. A. M. A. **102:** 42 (Jan. 6) 1934.
17. Coblentz, W. W.; Stair, R., and Hogue, J. M.: Tests of a Balanced Thermocouple and Filter Radiometer as a Standard Ultraviolet Dosage Intensity Meter, Bur. Stds., J. Research **8:** 759, 1932.

per square centimeter (or a total of 180,000 ergs) of homogeneous radiation of wavelength 2,967 angstroms does not produce an erythema on the average untanned skin, but it may cause a burn on a blond skin.

The Council has therefore adopted 10 microwatts per square centimeter of homogeneous radiation of wavelength 2,967 angstroms as the erythemal unit (E. U.) of dosage intensity;[16] that is, 1 E. U. = 10 microwatts per square centimeter of radiation of wavelength 2,967 angstroms. For a further discussion of this subject the reader is referred to the original papers.[16, 17]

With 20 microwatts per square centimeter (2 E. U.) of homogeneous radiation of wavelength 2,967 angstroms as a standard, in table 2 there are given the erythematogenic equivalents of the heterogeneous (the total integrated) ultraviolet radiation of wavelengths shorter than and including 3,132 angstroms required of various sources to produce a minimum perceptible erythema on the average untanned skin in fifteen minutes. For an exposure of sixty minutes the minimum permissible values are only one fourth as large. That is to say, the total energy of unit intensity (20 microwatts per square centimeter) falling on a surface in fifteen minutes is the same as when one-fourth the intensity (5 microwatts per square centimeter) is used and the surface is irradiated sixty minutes, or four times as long. From this table and from chart 7 it may be noticed that the lower the erythematogenic efficiency of the source, relative to the standard line at 2,967 angstroms, the greater must be the total ultraviolet intensity of wavelengths shorter than and including 3,132 angstroms in order to meet the Council's standardized erythemal requirements.

However, it would be a mistake to conclude that the lamp with the highest erythematogenic efficiency is necessarily the one which is most effective biologically. A good example is the relative effectiveness of the "cold quartz" and the "hot quartz" lamps and the sun. The "cold quartz" ultraviolet radiation (principally of wavelength 2,537 angstroms) is highly germicidal, but it does not produce tan, and if the exposure is too prolonged it is antagonistic to the production of vitamin D. The "hot quartz" lamp produces tan and vitamin D. But neither lamp is comparable with sunlight in producing tan, which permits long exposures in heliotherapy. In fact it is a question whether the "cold quartz" type of radiation should be used for general bodily irradiation or whether its application should be confined to special conditions.

The specification of intensities given in table 2 are average values, observed in a 0-5 degree zone subtended by the center as the source, i. e., within a circle approximately 4 inches (10 cm.) in diameter, lying in a plane at right angles to the axis of the reflector, at the specified operating distance (24 inches, 61 cm.) from the front edge of the reflector; it constitutes the minimum values accepted by the Council on Physical Medicine.

In concluding this discussion it is relevant to emphasize the importance of protecting the eyes from injury (conjunctivitis) which is caused by ultraviolet rays of wavelengths shorter than about 2,900 angstroms. This applies to all sources of ultraviolet that are not enclosed in glass bulbs, or covered with glass windows that absorb ultraviolet radiation of wavelengths shorter than about 2,900 angstroms.

Furthermore, ultraviolet lamps that are not thus enclosed in glass should be operated in large well ventilated rooms to keep down the concentration of ozone, which is generated by the radiation at 2,200 angstroms (and shorter wavelengths) and strongly emitted by mercury arc lamps, especially by lamps of the "cold quartz" type in which all the mercury is vaporized—also in the "hot quartz" type on first starting the lamp.

In concentrations of about one part per million by volume, ozone irritates the respiratory passages and causes coughing, headaches, and the like, depending on the time of exposure. For the same concentrations ozone is far more toxic than carbon monoxide.[18] Fortunately its presence is easily detected by the pungent irritating odor, in concentrations far lower than the injurious dose.

CONCLUSIONS

In general the lamps submitted to the Council have an intensity that is several times the minimum requirements tabulated. The operating distance and the time of exposure to a given type of lamp are specified by the manufacturer.

In some of the newer lamps the first productions did not comply with the specifications, but these lamps were promptly improved to meet competition with other types.

In general, the specifications by the Council have tended to improve the output of responsible lamp manufacturers, but at present there seems to be no means to prevent the exploitation of the public by the sale of cheap lamps emitting little or no ultraviolet radiation and by the sale of so-called "sun lamps" which emit ultraviolet radiation of wavelengths shorter than 2,900 angstroms (not present in sunlight) and which are dangerous because they produce conjunctivitis and, with excessive exposures, may cause coagulation of albumin (cataract).

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

AUSTIN SMITH, M.D., *Secretary.*

PENICILLIN IN OIL AND WAX (See THE JOURNAL, Sept. 7, 1946, p. 23).

The following dosage form has been accepted:

E. R. SQUIBB & SONS, NEW YORK

Penicillin (Calcium) in Oil and Wax: 300,000 units per cubic centimeter, 1 cc. cartridge and 10 cc. vials. Calcium penicillin suspended in peanut oil containing 4.8 per cent (W/V) white wax, U. S. P.

MANNITOL HEXANITRATE (See New and Nonofficial Remedies, 1946, p. 336).

The following dosage form has been accepted:

FLINT, EATON & CO., DECATUR, ILL.

Tablets Mannitol Hexanitrate: 32 mg.

PENICILLIN (See New and Nonofficial Remedies, 1946, p. 212).

The following additional dosage form has been accepted:

SCHENLEY LABORATORIES, INC., LAWRENCEBURG, IND.

Penicillin Calcium: 20 cc. vials containing 200,000 units.

---

18. Henderson and Haggard: Noxious Gases, Monograph 35, American Chemical Society. The Truth About Ozone, editorial, J. A. M. A. **61:** 1045, Sept. 27, 1913.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street - - Chicago 10, Ill.

Cable Address - - - - "Medic, Chicago"

Subscription price - - - - - Eight dollars per annum in advance

Please send in promptly notice of change of address, giving both old and new; always state whether the change is temporary or permanent. Such notice should mention all journals received from this office. Important information regarding contributions will be found on second advertising page following reading matter.

SATURDAY, OCTOBER 19, 1946

DIGESTIBILITY OF FAT

Misconception regarding the indigestibility of fat is common. Digestibility is ordinarily measured by comparing the amount of fecal fat with that ingested over a stated period; the difference, when adjusted for the more or less constant fecal lipid, is assumed to represent that part of the food fat which has been digested and absorbed. When calculated in percentage, the digestibility of fat is commonly above 95. Why, then, do physicians and laymen alike believe that fats and fatty foods are indigestible? The reason is that the satiety value of fats is high; the consciousness of fulness persists longer after a meal rich in fat than when other foods are consumed, and this in turn arises from the fact that fat retards the emptying of the stomach. Obviously, to consider digestibility in inverse relation to satiety value is a fundamental error.

Many studies of digestibility of fat have been carried out. Langworthy,[1] summarizing the extensive investigation in this field, pointed out that fats of animal and vegetable origin show high digestibility in man. Hydrogenated fats are likewise highly digestible; by adjusting the melting point either through blending or through altering the degree of hydrogenation it was shown that the coefficient of digestibility varies inversely with the melting point. Holt and his co-workers[2] showed that infants have the ability to digest and absorb fats efficiently, particularly if fats with long chain saturated fatty acids are eliminated. That heating of fat, as in deep fat frying, exerts little if any influence on digestibility has also been shown.[3] Stearin, whether in mixed glycerides or in mixtures of fats, appears to decrease the coefficient of digestibility of fats.[4] Of current interest is the evidence for the degree of digestibility of the fats in the margarines; Holmes[5] long ago reported that the fat in oleomargarine is more than 95 per cent digested, and recent data[6] have been published showing that the digestibility of the fat in the newer vegetable oil margarine is quite the same as that of butter when compared in human subjects.

Fat yields 9.3 calories per gram in metabolism and is therefore the richest source of food energy. Furthermore, the absorption of some fat is essential for the entrance of certain of the vitamins into the body. Reliable scientific evidence shows that fat is as well digested as are the carbohydrates and proteins, if not better, and that the source of the fat is of little importance. A clear distinction should be made between real digestibility and satiety value in assessing the dietetic value of fat.

1. Langworthy, C. F.: Indust. & Engin. Chem. **15**: 276, 1923.
2. Holt, L. E., Jr.; Tidwell, H. C.; Kirk, C. M.; Cross, Dorothea M., and Neale, Sarah: J. Pediat. **6**: 427 (April) 1935.
3. Smith, A. H.; Anderson, W. E.; Brooke, R. O., and Gordon, W. G.: J. Am. Dietet. A. **9**: 6 (May) 1933.
4. Hoagland, Ralph, and Snyder, G. G.: J. Nutrition **26**: 219 (Sept.) 1943.

PENICILLIN THERAPY IN PERITONITIS OF APPENDICAL ORIGIN

Fauley and his associates[1] reported a mortality of 92.6 per cent for fulminating, diffuse peritonitis in a series of 27 dogs following ligation of the base of the appendix, its mesentery and its blood supply. Deaths from peritonitis did not occur in a series of 48 dogs similarly treated but given penicillin one hour postoperatively. In a series of 19 dogs in which the initial treatment with penicillin was delayed for twelve hours the mortality was 21 per cent. Craig[2] reports the results of penicillin therapy in 7 cases of peritonitis in man associated with ruptured appendix. All recovered, although 1 patient died of pulmonary embolism ten days postoperatively; necropsy showed the peritonitis to be well cleared. The bacterial flora in each case was a mixture of gram positive and gram negative organisms. Equally striking results were obtained by Crile[3] from the massive doses of penicillin in the treatment of 25 patients with clinically established generalized peritonitis of appendical origin and in 25 patients with localized peritonitis. Definite abdominal masses were palpable in 8 at the time of admission; the pelvic or abdominal masses were palpable in 25 at some time during the course of the illness. All the patients were sick, their illnesses representing the most serious complications of appendicitis. These patients were given 100,000 units of penicillin every two hours intramuscularly in procaine solution or by continuous intravenous

5. Holmes, A. D.: Boston M. & S. J. **192**: 1210 (June 18) 1925.
6. Deuel, H. J., Jr.: J. Nutrition **32**: 69 (July) 1946.
1. Fauley, G. B.; Duggan, T. L.; Stormont, R. T., and Pfeiffer, C. C.: The Use of Penicillin in the Treatment of Peritonitis: An Experimental Study, J. A. M. A. **126**: 1132 (Dec. 30) 1944.
2. Craig, W. M., and others: Penicillin: A Progress Report Based on 1,455 Cases Treated at the National Naval Medical Center, Bethesda, Md., Prepared by the Penicillin Committee, U. S. Nav. M. Bull. **44**: 453 (March) 1945.
3. Crile, George, Jr.: Peritonitis of Appendical Origin Treated with Massive Doses of Penicillin: Report of 50 Cases, Surg., Gynec. & Obst. **83**: 150 (Aug.) 1946.

drip. This dosage was maintained until the clinical signs of peritonitis subsided or until the patients had been on 100,000 units of penicillin every two hours for at least six days. Four days was sufficient to control the average case; if satisfactory improvement occurred, the dosage was reduced to 100,000 units every four hours. It was felt unwise to discontinue large doses of penicillin before the sixth day of treatment, and sometimes ten or twelve days were required before large intra-abdominal masses began to resolve.

Crile emphasizes that the course of the peritonitis in these 50 patients differed in several striking respects from that seen prior to the use of penicillin. The patients did not appear sick after the first two days. Neither did the peritonitis appear to spread after the first twenty-four hours of treatment; in all cases but 1 definite clinical improvement had occurred by the fourth day. Many of these patients did not vomit, and they were able to take a full liquid diet during the course of the disease. In 50 per cent of the cases the temperature was normal by the end of the fifth day of treatment. The highest recorded pulse rate of the day had fallen below 100 by the third day on the average, and in only 4 instances did the pulse rate remain over 100 longer than one week. The majority in this group did not show signs of pronounced ileus, or, if they did so, it was only for a day or two. In 13 cases there was x-ray and clinical evidence of mechancial obstruction, and in 12 of these 13 cases the obstruction was associated with a palpable mass. Crile feels that the ileus was probably the result of mechanical obstruction in an inflammatory mass rather than secondary to the paralytic action of a generalized peritonitis. In every case the passage of a Miller-Abbott tube corrected the obstruction, and in only 1 instance did it recur and required a second decompression. One half of the patients in this group developed intra-abdominal masses, but in no instance was it necessary to resort to incision and drainage. There also apparently was no instance in which pus was discharged spontaneously into the bowel. In several patients symptoms recurred after being once controlled and the mass became larger after treatment with penicillin, but in each case a second course of treatment resulted in complete resolution of the mass.

Administration of penicillin did not cause a reduction in instances of wound infection. In this group 36 per cent of the wounds became infected. However, the infection did not exhibit severe local or systemic reaction. These wounds healed with remarkable rapidity after the discharge of the pus.

In view of the demonstration by Altemeier [4] that cultures of Escherichia coli or of Bacillus pyocyaneus have the property of destroying the activity of penicillin, it is rather remarkable that peritonitis due to mixed infections can be controlled by concentrations of penicillin less than one tenth of the minimum level required to inhibit the growth of Escherichia coli, the predominant organism in infection. It appears however that, by giving enough penicillin over a long period of time, eventually more penicillin is given than Escherichia coli can destroy, and finally there is built up a sufficient concentration of active penicillin to inhibit the growth of the virulent cocci. Furthermore, it is not Escherichia coli but the gram positive cocci that are the chief offenders in peritonitis. Once the cocci are controlled, the peritonitis is successfully combated by the defensive and absorptive mechanism of the peritoneum. There was but one death in this series, and this did not occur as a direct result of peritonitis but from thrombosis of the mesenteric vessels.

4. Altemeier, W. A.: Inactivation of Penicillin by Various Gram Negative Bacteria, Surg., Gynec. & Obst. **81**: 379 (Oct.) 1945.

DIISOPROPYL FLUOROPHOSPHATE FOR GLAUCOMA

Several of the alkyl fluorophosphates described by Lange and Krueger in 1932 have been studied for their effects on the body. McCombie and Adrian and their associates noted the similarity between the cholinergic effects of the fluorophosphates and those of physostigmine. In the chemical theory of mediation of nerve impulses through the autonomic nervous system acetylcholine is the mediator. The enzyme cholinesterase, found at sites where acetylcholine is liberated by the nerve impulse, causes rapid hydrolysis of acetylcholine. The acetylcholine-like action of physostigmine is thought to be due to an enzyme inhibition of cholinesterase in vivo, with resultant accumulation of acetylcholine. Mazur and Bodansky,[1] in an experimental study of the inhibition of tissue cholinesterase by one of the fluorophosphates, diisopropyl fluorophosphate, showed that a parallelism exists between in vitro sensitivities and the extents to which various tissue cholinesterases are inhibited in vivo. The inhibition of cholinesterase activity of serum, red blood cells, brain and muscle was studied in the rabbit, monkey and man, using a wide range of diisopropyl fluorophosphate concentrations. The rate of restoration of serum cholinesterase in monkey and man was slow. Dialysis or dilution of cholinesterase-diisopropyl fluorophosphate mixtures or of tissue cholinesterases from animals poisoned with diisopropyl fluorophosphate did not result in any increase of the cholinesterase activity. These experiments indicated that the inhibition of cholinesterase by diisopropyl fluorophosphate was not readily reversible.

The parasympathomimetic ocular effects of diisopropyl fluorophosphate ("DFP") have recently been

1. Mazur, Abraham, and Bodansky, Oscar: The Mechanism of In Vitro and In Vivo Inhibition of Cholinesterase Activity by Diisopropyl Fluorophosphate, J. Biol. Chem. **163**: 261 (April) 1946.

studied critically in the rabbit, cat, dog and man by Leopold and Comroe.[2] Reports of other workers were confirmed that the drug produces prolonged miosis, spasm of the ciliary muscle, false myopia and decrease in intraocular tension. Quantitative species variations were found to exist, but the effects were most definite and prolonged in man. A 1 per cent solution of diisopropyl fluorophosphate locally instilled in the eye produced more prompt, pronounced and prolonged miosis than a 5 per cent solution of neostigmine bromide. In the concentrations used by the authors there was no direct effect on the iris muscle itself, since diisopropyl fluorophosphate failed to constrict the totally denervated cat iris. The effects, therefore, were due entirely to inactivation of cholinesterase. The cycloplegic effects in human eyes of 4 per cent homatropine hydrobromide were overcome by a 0.1 per cent solution of diisopropyl fluorophosphate and that of 1 per cent atropine sulfate by a 0.2 per cent solution of diisopropyl fluorophosphate. The capillary permeability for fluorescein but not for inulin was increased by diisopropyl fluorophosphate. The possibility of systemic effects following the instillation of the compound into the conjunctival sac was considered. In 1 of 11 cats, two drops of aqueous solution in each eye produced such effects as salivation and muscle tremors. This was much less frequent than after a 5 per cent solution of neostigmine bromide. In man however, after several thousand instillations, subjective or objective evidence was not found of systemic nicotinic action or parasympathomimetic hyperactivity. Nevertheless minimal systemic absorption from the conjunctival sac did occur, as shown by a slight decrease in the plasma cholinesterase without appreciable reduction in red cell cholinesterase. The authors point out that this does not mean that significant absorption will not follow if the local use of diisopropyl fluorophosphate is frequent and indiscriminate. Significant differences were not demonstrated between oil and water as a vehicle for ophthalmic use except that the compound was more stable in peanut oil than in water.

In a second study [3] published concomitantly the two Philadelphia investigators report the use of this drug in the treatment of glaucoma. A total of 52 patients with 78 glaucomatous eyes were treated during a period of six months. Hospitalization was provided for the period of observation, which included a preliminary twenty-four hours during which the patient did not receive miotic therapy. Miotic agents had been used previously on almost all the patients. Tensions were considered controlled in those eyes in which the tension was maintained at or below 30 mm. of mercury (estimated with a Schiøtz tonometer) and in which no loss of visual fields occurred. Clinical trial indicated that 0.05, 0.1 and 0.2 per cent concentrations in oil were suitable for use in eyes with chronic simple glaucoma. If the 0.2 per cent solution was ineffective there were no advantages noted by using stronger concentrations. The majority of the eyes were treated with 0.05 or 0.1 per cent concentration in a peanut oil vehicle. The intraocular tension was controlled in the majority with fewer daily instillations than with either 1 per cent pilocarpine nitrate and/or 0.2-0.5 per cent physostigmine salicylate. In all glaucomatous eyes which responded to pilocarpine or physostigmine diisopropyl fluorophosphate was also effective and usually maintained an intraocular pressure at a lower level. Dermatitis and conjunctivitis did not occur from continued use in any of the patients treated. In 36 glaucomatous eyes in 29 patients in which treatment with pilocarpine or physostigmine had previously failed, the intraocular tension was controlled by diisopropyl fluorophosphate. Several untoward ocular effects were noted which included visual blurring, brow ache and eye ache, spasm of accommodation and pericorneal injection. Similar symptoms were noted in normal eyes after instillation of diisopropyl fluorophosphate. However, none of the patients with these symptoms were sufficiently troubled that they asked to be returned to their previous medication. As sometimes seen with the use of other miotics, 2 patients showed a rise in intraocular tension after the instillation of diisopropyl fluorophosphate, 1 with chronic simple glaucoma and the other with congenital glaucoma. The tension in the congenitally glaucomatous eye fell spontaneously after the initial rise, but iridectomy ab externo had to be performed in the eye with chronic simple glaucoma to return the tension to its normal level. As in the normal eye, evidence of minimal absorption from the conjunctival sac was noted by a slight depression of serum cholinesterases in a few cases, but systemic symptoms were never observed.

Of the several drugs introduced in recent years for the therapy of glaucoma, only neostigmine is an anticholinesterase agent. No single drug has proved satisfactory for the treatment of all forms of glaucoma, but each has found a definite place and value in therapy. The Philadelphia investigators point out that although diisopropyl fluorophosphate has a more prolonged anticholinesterase effect than either neostigmine or physostigmine, it does not fulfil all the requirements of an ideal miotic antiglaucomatous agent. However, diisopropyl fluorophosphate does have certain attributes which must entitle it to serious consideration and further prolonged critical study to determine fully its clinical efficacy.

2. Leopold, Irving H., and Comroe, Julius H., Jr.: Effect of Diisopropyl Fluorophosphate ("DFP") on the Normal Eye, Arch. Ophth. **36**: 17 (July) 1946.

3. Leopold, Irving H., and Comroe, Julius H., Jr.: Use of Diisopropyl Fluorophosphate ("DFP") in Treatment of Glaucoma, Arch. Ophth. **36**: 1 (July) 1946.

Current Comment

POSTMORTEM BLOOD TESTS AS MEANS OF IDENTIFICATION

The value of blood tests for purposes of identification is unquestioned. As used here identification refers not only to persons but also to blood deposits and materials the precise origin of which needs to be determined as definitely as possible. The obvious possible consequences of omission in murder cases, for example, to save samples of the victim's blood illustrate the responsibility of the examiner in this matter. For instance, failure to get samples may take away the only means to determine whether a given blood deposit might have come or could not possibly have come from a certain person. Conceivably in a case of disputed identity blood group tests might give results of decisive importance. Provision should be made to collect and save samples of blood at necropsies for eventual blood group tests much more regularly than is now the usual practice. This injunction applies particularly of course to coroner's physicians. So far the value of blood group tests as means of identification has received little or no attention in books on postmortem technic. The practice of the office of the medical examiner in New York City sets the standard: Samples of blood for blood group determinations are collected as a routine procedure in all homicides, in all suspected cases and in all instances of death caused by "hit and run" automobiles. As a rule samples of blood are not taken in cases of natural death, of suicide or from accident unless suspicious circumstances are present.

HEREDITARY FACTORS IN TOXEMIAS OF PREGNANCY

The tendency toward inheritance of a constitution susceptible to high blood pressure is well known, although the evidence for this is based more on records of individual families than on acceptable statistical data. Further, there have been numerous reports of the occurrence of eclampsia, toxemia and hypertensive disease in members of the same family. Recently two British investigators [1] have reported the results of a study undertaken to assess the hereditary factors in the causation of the hypertension of the toxemias of late pregnancy. The blood pressure was determined in 226 blood relatives of 129 patients admitted to the University College Hospital, London, for toxemia of pregnancy. A control group was studied consisting of 66 relatives of 47 patients admitted to the hospital toward the end of pregnancy for some reason other than toxemia, such as antepartum hemorrhage. The levels of blood pressure were not demonstrably different between the relatives of eclamptic and preeclamptic patients and the control patients. However, a definite difference was found in the cases of essential hypertension and pregnancy. In this group 16 of 18 mothers were hypertensive. The authors conclude that hereditary tendencies to hypertension are not important except in the latter group. They conclude also that pregnancy need rarely be interrupted in essential hypertension and that patients with a familial history of hypertensive cardiovascular disease should not be discouraged from having children except in rare cases in which there have been early and frequent manifestations of the disease. This preliminary report must be accepted with reserve until confirmed by independent investigators. Nevertheless it is of definite interest in relation to the problems of the hereditary factors of hypertension and its associated diseases. The study of similar groups of relatives of patients with toxemias of pregnancy should be extended and the results given critical statistical analysis.

1. Barnes, Josephine, and Browne, F. J.: Blood Pressure of Relatives of Patients with Toxemia of Late Pregnancy, J. Obst. & Gynec. Brit. Emp. 52: 559 (Dec.) 1945.

DIABETIC PERSONS APPRECIATE DOGS

The American Diabetes Association passed the following resolution at its Toronto meeting, September 17, and submitted a copy of it to THE JOURNAL:

WHEREAS, The American Diabetes Association at this meeting is commemorating the twenty-fifth anniversary of the discovery of insulin; and

WHEREAS, Insulin has been instrumental in restoring the health and saving the lives of countless human beings suffering from diabetes; and

WHEREAS, The great work of Banting and Best in discovering insulin, and the subsequent scientific investigations clarifying its actions and uses, would have been impossible without the use of dogs and other domestic animals as experimental subjects; therefore, be it

Resolved, That the American Diabetes Association hereby testifies to the value of the use of dogs and other domestic animals for purposes of scientific research and urges all enlightened citizens to refrain from supporting the misguided efforts of so-called antivivisectionists, who constantly try to hamper the advancement of scientific medicine.

One of the main efforts of the antivivisectionists in their determination to discredit scientific medicine and research has been the claim that insulin has done nothing for persons with diabetes. They have based their contention on the fact that diabetic death rates have continued to rise, and they have at the same time ignored the fact that persons with diabetes live longer and better than ever before. This expression of appreciation from diabetic patients themselves for the contributions made by research laboratories using dogs and other domestic animals will have little if any influence on the closed minds of the antivivisectionists. It should, however, appeal to the openminded, intelligent persons. Physicians should therefore call it to the attention of legislators whenever and wherever the antivivisectionist legislative proposals are introduced.

ORGANIZATION SECTION

THE ATLANTIC CITY SESSION

How to Use Application Blank for Making Hotel Reservations

A list of Atlantic City hotels, schedule of rates, map showing locations and an "application for hotel accommodations" appear on advertising pages 74 and 75 of this issue of THE JOURNAL. It is important that those desiring hotel accommodations for the centennial meeting use the form in THE JOURNAL and send it not direct to the hotel but to Dr. Robert A. Bradley, Chairman, Subcommittee on Hotels, 16 Central Pier, Atlantic City, N. J. All hotel assignments will be cleared through Dr. Bradley's committee, even though addressed to an individual hotel. Naturally, applications should be sent as soon as possible and several choices of hotels given, as indicated in the application form.

Washington Letter

(From a Special Correspondent)

Oct. 13, 1946.

Disabled Veteran Physicians Will Get Books and Equipment During Residency

Veterans Administrator Omar Bradley has announced that disabled physician veterans will be supplied with books and equipment during their hospital residency. A group of veterans had complained about a ruling of Veterans Administration officials that resident doctors had completed medical school, were licensed and were not entitled to G. I. Bill of Rights funds for continued teaching. General Bradley also said that nondisabled physician veterans serving as hospital residents would get the same books and equipment. The cost in any case is not to exceed $500 yearly. The Veterans Administration chief has also ordered a study of teaching hospitals to determine whether veteran doctors are getting full G. I. benefits.

Criticism of Medical Care in Coal Mines

A report of the Coal Mines Administration medical survey criticizes coal company doctors for lack of interest in the welfare of miners. Rear Admiral Joel T. Boone was head of the survey, made under the agreement between Secretary of the Interior Krug and United Mine Workers Leader John L. Lewis, to determine what is necessary to provide miners with "medical, housing and sanitary facilities conforming to American standards." Admiral Boone charged that the company doctors rarely go into the mines to check patients' working conditions, do not teach or promote first aid and display only a casual interest in personal hygiene, nutrition, sewage disposal and the water, milk and food supplies of the miners. The American Federation of Labor incidentally indicated at its Chicago meeting that it was taking a leaf from the Lewis book in seeking health and welfare funds for its union members.

Eventual Conquest of Cancer Predicted by Dr. R. R. Spencer

Dr. R. R. Spencer, chief of the National Cancer Institute in Bethesda, Md., told the 2,000 doctors who attended the seventeenth annual scientific assembly of the Medical Society of the District of Columbia that chemicals now under study and others to be developed may provide the cure for cancer. Already chemicals which will destroy cancer, leaving the adjacent tissue normal, have been produced. On the panel with Dr. Spencer were Dr. Edgar McPeak, who discussed radiation treatment of cancer; Dr. William P. Herbst Jr. of Georgetown University; Dr. Calvin P. Klopp, director of the Warwick Memorial Cancer Clinic, and Dr. Brian Blades of Georgetown University. Dr. John A. Kilmer, professor of medicine at Temple University, expressed a qualified opinion that streptomycin may be the long sought drug to defeat tuberculosis. Possibility of a cure for tuberculosis and perhaps of dysentery was seen in the isolation of a new substance called subtilin, according to Dr. T. L. Swenson of the Western Regional Research Laboratory of the Department of Agriculture in Albany, Calif. Dr. G. J. P. Barger of Georgetown University Medical School reported that a sick person's own blood, irradiated momentarily through ultraviolet light, underwent some chemical change which gave it immunity against bacterial infection.

General Erskine Checks Artificial Limb Production

Major Gen. Graves B. Erskine, head of the Reemployment and Retraining Administration, is checking reports that improvements recommended by the Committee on Prosthetic Devices are not to be used in the actual production of new artificial arms and legs and that old style legs are being made because they are cheaper. In its participation in Employ the Physically Handicapped Week the U. S. Civil Service Commission reveals a report of medical officers that 2,858 handicapped persons had proved their ability to be equal to twice the number of so-called able bodied persons covered in the inquiry. There was less turnover in the handicapped group.

Voluntary Hospitals Foreseen as "Pace Setting Ally" of Public Services

Mrs. Eugene Meyer, a member of the Surgeon General's advisory committee to implement the Federal Hospital Survey and Construction Act, told the New York United Hospital Campaign that the act was the "first step toward a rationalized hospital system for the nation." She said that voluntary hospitals must "take the lead in creating a unity of all those facilities that will build a healthier America" by remaining a "friendly, pace setting ally of our steadily expanding public services."

Veterans Hospital on Tract Adjoining Arlington National Cemetery

Opposition of Arlington County and federal planning agencies to the use of the Nevius tract, adjoining Arlington National Cemetery, for a 750 bed new Veterans Administration hospital appears to have been withdrawn. Washington and New York architects, already commissioned to draw plans for the hospital, have been authorized by the National Commission of Fine Arts to make studies of use of the tract. There are now 104,612 patients in veterans' hospitals, a gain of 29 per cent since VJ day.

American Association for Advancement of Science in a Permanent Home

For the first time in its ninety-eight years the American Association for the Advancement of Science has a permanent home, in a red brick mansion at 1515 Massachusetts Avenue N.W. The organization hopes to have modern new headquarters on the same site by the time its hundredth anniversary arrives. It is the largest group of scientific organizations in the world, with 28,724 individual members and 195 affiliated and associated societies. It was for many years housed in the Smithsonian Institution.

Nationwide Study of Child Health Services Being Made Available

The American Academy of Pediatrics will make available on state, county and community levels the results of a nationwide study of child health services. This was decided by the academy because of numerous requests from community health organizations, public health services and private physicians. Dr. John P. Hubbard, director of the national study, said that about fifteen months and $250,000 would be required to analyze and tabulate statistics. Figures were furnished by the National Foundation for Infantile Paralysis, Marshall Field Foundation and various pharmaceutical concerns and local service groups. The U. S. Public Health Service and the Children's Bureau will cooperate in the statistical analysis at the U. S. P. H. S. office, 7900 Rockville Pike, Bethesda, Md.

Joint Committee for the Coordination of Medical Activities

NOTE.—At a meeting in Chicago, October 12, the Committee on Postwar Medical Service decided to change its name to the one at the head of this item.

Minutes of Meeting of June 8, 1946, in Chicago

The Committee on Postwar Medical Service met in the Board of Trustees Room of the American Medical Association Building, 535 North Dearborn Street, Chicago, Saturday, June 8, and was called to order by the Chairman, Dr. Ernest E. Irons, at 10:15 a. m. Members of the Committee and visitors present were Dr. Irvin Abell, Dr. Walter L. Bierring, Dr. Edward L. Bortz, Mr. Howard A. Carter, Major Gen. Warren F. Draper, Capt. William E. Eaton (MC), U.S.N., Dr. Hugo F. Hullerman, Dr. E. L. Henderson, Mr. Thomas A. Hendricks, Dr. Ernest E. Irons, Dr. Victor Johnson, Dr. Edwin P. Jordan, Dr. Perrin H. Long, Dr. George F. Lull, Dr. J. J. Moore, Dr. Carl M. Peterson, Dr. R. L. Sensenich, Dr. H. H. Shoulders, Miss Mary Switzer and Lieut. Col. John H. Voegtly.

COMMITTEE MEMBERSHIP

A letter was presented from Dr. Francis G. Blake in which he tendered his resignation as a member of the Committee. The Committee expressed regret in accepting the resignation.

REPORT ON BUREAU OF INFORMATION

Dr. Lull gave the following summary with respect to the Bureau of Information:

The work of the Bureau of Information, as such, has fallen off some, since not so many veterans are looking for locations at present. The peak has been passed, but it is expected there will be another peak when the men come out of the training courses. The Bureau prepared an exhibit to be displayed at the annual session of the American Medical Association in San Francisco showing the distribution of physicians in the United States. It is thought to be completely up to date, even though the situation is changing all the time and it is difficult to keep abreast of the changes. The exhibit is a graphic illustration so far as the present situation is concerned. There also is a diagram showing the rural-urban ratio of physicians.

The Bureau's work has been somewhat extended recently in that it is lending considerable assistance in the activities of the Committee on Rural Medical Service and acting as a "clearing house" for that committee.

General Draper remarked that he had seen the exhibit and that the knowledge that such complete information is available and can be obtained in the Association's office is of great value.

Miss Switzer asked whether there was any way of telling how many physicians have gone to less advantageous localities. Dr. Lull replied that the men are told of localities where their services are needed and, as a rule, referred to the state medical society secretaries in the states concerned. He said that most of the state secretaries have been very active in this matter and that it is known that some few men have settled in rural areas, although there is no way of telling just how many.

The Chairman thought that the exhibit of the Bureau of Information demonstrates that with the efforts now being exerted redistribution can be accomplished on a voluntary basis with complete observation of state rights.

SURPLUS SUPPLIES

In the absence of Father Schwitalla, Chairman, Subcommittee on Surplus Medical, Dental and Hospital Supplies, Miss Switzer, member of the subcommittee, offered the following report:

The Surplus Property Act provides for disposal of surplus property to public and health educational institutions at a discount fixed by the War Assets Administration. At the present time the discount is 40 per cent from fair value. The Federal Security Agency has always urged that the discount be considerably higher. Negotiations are currently being held with the War Assets Administration as a result of which it is hoped that the discount will be increased considerably. Public health institutions operated on a nonprofit basis or maintained by state and local governments may acquire this property under a priority system. Institutions operated as agencies of the federal government are not included in the discount category, although they are entitled to priority. The priority setup is somewhat as follows:

In the first groups are included veterans of World War II, federal agencies and small businesses purchasing through the Reconstruction Finance Corporation. The next priority is given to purchases by state and local governments and their instrumentalities. The final preference group consists of nonprofit educational, public health, public welfare and similar institutions. Generally, property is not sold to commercial buyers until priority groups have first been given opportunity to buy.

Under the procedure in effect since February, public health claimants make application for surplus property to representatives of the Public Health Service stationed in the various regional offices of the War Assets Administration. Applications are not sent to Washington. On receipt of an application in the War Assets office it is approved by the public health representative and certified for the price discount. The order is then filled, provided, of course, the property has not been completely absorbed by higher priority groups.

In addition to the vast amount of personal property which has been declared surplus there are hundreds of millions of dollars worth of real estate appropriate for public health uses. Applications for the acquisition of real estate are handled in Washington. The discount on purchases of real estate varies and may amount to a 100 per cent discount, being in effect a donation, where sufficient public benefits will accrue to the United States from the use of the property for public health purposes. The determination as to the amount of discount is made by the War Assets Administration rather than by the Public Health Service, although the service often functions in an advisory capacity on such questions. To date the Public Health Service has surveyed and reported on real estate valued at $280,000,000 with recommendations that this property be conveyed to public health claimants. It might be added that in fourteen weeks of operation orders for about $8,000,000 in personal property were certified by the Public Health Service.

The full effect of recent amendments to the Surplus Property Act on veterans' preference is not yet known. A considerable proportion of drugs, medical and dental supplies and equipment, as well as mechanical equipment useful in the sanitation fields, will be set aside for veterans only. However, the War Assets Administration is planning on an extensive spot sale or site sale program. To meet these new plans the Public Health Service is drastically streamlining its procedures to permit eligible public health claimants to purchase property on the spot through the use of a discount certificate to be issued by the Public Health Service. The use of this certificate by the claimant will eliminate the necessity of having individual orders approved. It will automatically entitle the purchaser to the discount whether he buys at spot sales or from catalogue orders.

Educational institutions have been purchasing surplus property under similar procedures with orders being approved by representatives of the U. S. Office of Education. Orders certified for school use under the procedure likewise total about $8,000,000. The educational procedures are being streamlined in a manner comparable to the public health procedure previously outlined. It is hoped that all these new procedures will be in operation by July 1, 1946.

Miss Switzer stated that there is a great deal of real estate available. In response to a question from the Chairman as to protests against the priority setup, she said that the sentiment is about fifty-fifty whether the veterans' priority is or is not desirable and that the educational people have not been enthusiastic about the blanket certification but that it has had to be adopted because it is the only practical method; that the Federal Security Agency is in the picture to aid health and educational institutions in acquiring the property and is not in it to slow up matters. Dr. Bierring thought that the change in priorities has delayed opportunities for health agencies and hospitals to obtain material. Miss Switzer remarked that some surplus property, such as jeeps and bulldozers, probably never would be acquired by health agencies and that almost all the automotive equipment has been set aside for the veterans.

Miss Switzer's report was received with thanks.

INTERN AND RESIDENCY OPPORTUNITIES

Dr. Johnson offered the following summary with respect to intern and residency opportunities:

In 1941 there were 5,256 residents in approved residencies. On June 1, 1946 there were 8,125 residencies in approved hospitals. This represents an increase of about 55 per cent. Some of this expansion has been facilitated by the program in which the Council on Medical Education and Hospitals and the specialty boards have agreed to a procedure of temporary approval of residencies in which the residency program is evaluated on the basis of reports which describe the educational program and the qualifications of the men operating it. If we have little or no doubt about the institution, we put it on the approved list. Virtually all the specialty boards are collaborating in this process. About two hundred residency programs have been given temporary approval under this arrangement, which provides for considerably more than that number of actual residents. The program has been in operation about ninety days. The expansion in residency places is considerable and is meeting the needs of a corresponding number of veteran medical officers. All of us, however, freely admit that it will be difficult to meet the needs of all medical officers at the present time. The short duration of the period between V-E day and V-J day multiplied the problem tremendously.

Hospitals are working hard to increase their educational facilities and are continuing to expand in large numbers, so that it is probable that we shall have perhaps as many as 10,000 approved residency places within six months or perhaps a year. That is the number we estimated we would need if the war had continued as long as most people seemed to think it would. Before the war there were 5,256 residents at work. An expansion beyond 10,000 residencies is a little too great, since this

would too greatly dilute the training programs. The expansion required in the different fields varies, as does the degree of expansion which has been effected from specialty to specialty. The outstanding problem is in the field of surgery, where many more want training than in any other field and where the expansion has not been very great.

Dr. Henderson asked what percentage of those applying for residency training had been accommodated, and Dr. Johnson stated that the present figures indicate that training has been provided for about 3,000 in newly created residencies. In addition, he said, over 2,000 openings were provided by discontinuing deferment of reserve officers beyond the nine month internship. Dr. Long asked how many veteran medical officers are now working in the veterans' hospitals, and Dr. Johnson replied that there are very few and that the Council on Medical Education and Hospitals is beginning to get inquiries from the veterans' hospitals regarding approval of residencies.

Captain Eaton stated that the Navy is making every effort to improve its standards of training in the medical department; library facilities are being improved; a consultation board has been set up composed of men well qualified in special fields who will assist and advise; consultant committees are being set up in the localities where naval hospitals are established; internships are being reported back to the Bureau of Medicine and Surgery on a special new form which gives complete information as to what is being done for the intern.

Miss Switzer asked if there is any information as to whether graduates of unapproved schools who had been taken into the Army have been able to get further training since their release from service. Dr. Johnson stated that a policy had been adopted whereby such graduates who served in the armed forces may take residencies in approved hospitals provided they are licensed in the state where they wish to take their residencies—particularly Illinois and Massachusetts. He said that New York has a special ruling. It was his opinion that this policy affords the graduates of unrecognized schools a wider choice of hospitals than heretofore.

EDUCATIONAL PROGRAM UNDER THE G. I. BILL

Dr. Johnson presented the following report:

At the meeting of this Committee in March I presented the agreement that was finally reached with the Veterans Administration outlining its educational program. The program has helped considerably to line up the hospitals and the veterans, although there still is considerable dissatisfaction with its operation, as a hospital has to be approved by a state agency which approves everything from hospital training to the training of apprentices in garages. A hospital also has to be approved by the local Veterans Administration agency. The veteran has to have his claims approved by the Veterans Administration, and that has to be taken care of by the hospital. All of this results in considerable delay. Father Schwitalla thinks it would be wise to continue the subcommittee to see if, through central headquarters in Washington, the procedure might not be accelerated.

Dr. Bierring asked how the residency arrangement in veterans' hospitals might affect the general situation. Dr. Long thought that in about five or six years when the supervised veterans' hospitals go into the open market for internships the civilian hospitals will be seriously affected. He said there will be about 500,000 women available as patients in the veterans' hospitals and that there are possibilities of other changes which, if they take place, will make the veterans' hospital a general or university hospital. General Draper remarked that it is not the money which attracts the young men seeking internships but the opportunity to qualify themselves. Dr. Johnson said that, regarding the affiliation of veterans' hospitals with medical schools, virtually all medical schools are collaborating to some extent and in varying degrees with veterans' hospitals which are in operation or are planned for the immediate future.

The Subcommittee to Confer and Cooperate with the Veterans Administration was continued. That subcommittee consists of Father Schwitalla, Chairman, Dr. Coller, Dr. Johnson and Mr. Holloway.

SUPPLY OF MEDICAL STUDENTS

The following report was presented by Dr. Johnson:

The situation is now more favorable than we thought it would be. We are circularizing all medical schools now regarding the 1946 autumn class. Virtually all schools are starting new classes in the autumn. We now have information from 67 of the 77 schools. These have so far selected 4,466 students. If we compare that with the number of freshmen in those schools at the present time, we note that the 67 schools have now admitted 80 per cent of a normal freshman class. However, if we take all the schools, we find that the 4,466 is about three fourths of the total. About 25 per cent of a normal class remains to be selected. Regarding the quality of the applicants, about half of the schools feel they are about of the same quality as formerly. About a fourth thought their applicants were inferior and about a fourth thought they were even better than formerly. Sixty per cent of those already admitted are veterans, including 18 women veterans. We may anticipate that there will be over 3,000 veterans in the 1946 freshman class.

POSTWAR RURAL MEDICAL SERVICE

Mr. Hendricks, in the absence of Dr. F. S. Crockett, offered the following remarks:

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION for June 8 contains the proceedings of the Rural Health Conference recently held in Chicago. This report is informative. Committees have been appointed by twenty-eight state medical societies in coordination with the farm groups in those states. The state of Colorado recently formed a commission to investigate and take care of the rural problems in that state. This commission is making a survey of the various counties and localities in the state where medical service is needed.

The urgency now is to get the medical societies and the farm committees together to discuss these problems.

Physicians are being urged to go into the rural communities. In the majority of cases the financial reason for refusal of doctors to locate in rural areas is secondary. It is hoped this Colorado commission will clear up a lot of that and that through its activities a basis for work in other states can be obtained. The Farm Bureau is lending two men to the commission to make the survey in the various counties. If a medical society says a doctor is unwilling to locate in a place where he may be needed because the community does not have the proper cultural facilities, the Farm Bureau tells the people it is their own fault. It is thought that at the present time the farmers have the money to pay for medical service, but the big problem is getting the facilities to them and educating the farmers to use them. Two or three pilot plans are going to be set up to see what can be done along the line of health centers. The United States Chamber of Commerce is interested and has formed a Small Community Committee to work on the small community health program.

VETERANS' AFFAIRS

There was discussion as to the advisability of discontinuing the Subcommittee on Establishment of a Medical Corps in the Veterans Administration. It was brought out that it is not likely that much more can be accomplished at this time and that fairly satisfactory arrangements had been made under the provisions of the newly enacted Veterans Administration bill. A motion to discontinue this subcommittee was withdrawn pending a report from Father Schwitalla.

LICENSURE

Dr. Johnson reported as follows on the licensure of residents: There is a very undesirable tendency on the part of state licensing boards to require hospital residents to be licensed in the states. More and more states are instituting this educationally undesirable requirement. It is a matter of the definition of a resident. Licensing boards say that a resident is practicing medicine and therefore should be licensed. I am inclined to feel that a resident is still a student practicing medicine under supervision.

Dr. Lull stated, with respect to difficulties encountered by veteran medical officers in becoming members of county medical societies, that little can be done except to bring moral pressure. Dr. Fishbein and he had talked in several instances to people who have been involved in this situation. One thing comes up constantly about returning men, and that is that they cannot get back their places on hospital staffs; they are told that the staffs are full.

Dr. Bierring said that, unless there is some change in the methods of the state boards, legislation now pending in Congress and popular sentiment are going to arouse a great deal of feeling against the medical profession for a rather strict attitude. He moved that the Committee on Postwar Medical Service petition the state boards of medical licensure and the boards of examiners in the basic sciences to accord every consideration and facility to returning medical officers so that their licensure may be completed as soon as possible. The motion was seconded by Dr. Henderson and carried.

In submitting a report at this time, it is proper to recall the changes and adjustments made in medical licensure to meet the requirements of the war period.

1. Accelerated Courses of Medical Training: The boards of medical licensure in each state, the District of Columbia and the territories of the United States accepted the accelerated course of medical training in approved medical schools for the duration and six months thereafter.

2. Hospital Internships: A majority of those licensing boards requiring one year or twelve months of acceptable hospital internship for admission to licensure accepted a nine month internship, in lieu of the usual requirement, for physicians entering military service. The other boards agreed to accept, in lieu of the incompleted three months, military service actively engaged in medical or surgical work.

3. Temporary Licensure: In only three states, Pennsylvania, Nevada and Florida, was any provision made for temporary licensure of physicians transplanted from another state to carry on medical or surgical work connected with the war effort.

As regards the medical licensure problems affecting the returning medical officer, the following is submitted:

1. Such graduates of approved medical schools as were prevented by entrance into military service from taking the licensure examination were not given any credit for military service or exemption from the required licensure examination.

2. In extending reciprocity or interstate endorsement, no special exception or provision was made for returning medical officers.

3. Graduates of unapproved medical schools who completed acceptable military service of two or more years were not accorded any special licensure consideration by reason of such military service. The exceptions were (*a*) in Illinois and Massachusetts, where unapproved medical schools are located and graduates of the same are admitted to licensure in those states; (*b*) in New York State a Veterans' Committee has passed on individual applications and admitted to licensure examinations applicants who submitted evidence of one or more years of military service actively engaged in medical or surgical work.

4. In states where a license is required of hospital residents, few exceptions were made from existing requirements for returning medical officers, even for periods of special postgraduate study of less than one year.

In reviewing these licensure experiences of returning medical officers, it seems evident that boards of medical licensure examiners (including special boards in the basic sciences) have rather short memories as regards World War II. Even with acceptable credentials, there is much unnecessary delay, often of several months or more, before licensure can be completed.

POSTWAR INDUSTRIAL HEALTH

Dr. Peterson presented the following statement:

There are a number of postwar problems. The chief one is the intensification of the health and welfare principle in collective bargaining. For a number of years we have noted that health has been increasingly emphasized in employment contracts with individual unions. The executive committee of the Council on Industrial Health recently went to Washington to inquire about the principle being established in the negotiations between mine operators and mine unions. It seems clear that on the basis of agreements now under consideration a health and welfare fund jointly operated and administered by the employers and employees would be an established principle. That is writing an entirely new charter for industrial medicine as we have known it. The Council, with one or two exceptions, I think, believes this trend is a healthy one. The influence of labor in this picture will tend to reduce abuses that have crept into industrial medical practice. The demands made on industrial medicine are changing. The element of prevention is coming to be the cardinal principle in all industrial health activity. However, there will be for many years need for the highest possible standards in industrial medicine and surgery.

Another development much emphasized in recent years is a positive health program to include all essential elements of physical and mental fitness directed at the working population. A physical fitness program actively sponsored by medicine, management and labor could do much to elevate the well being and productive capacity of workers.

As the complexion of demands on industrial physicians is changing, we have the problem of training to meet the new situation. A series of conferences have been held between the Council on Industrial Health and the Council on Medical Education and Hospitals. There is a considerable demand for certification of industrial physicians, and advances have been made to the Advisory Board for Medical Specialties and there has been some encouragement. It is difficult to define the specialty. For instance, who is to come in under the founders' provision without examination? There is need for the establishment of a suitable educational program as in the other specialties, but this has not been possible up to the present. It is hoped that the Council on Medical Education and Hospitals will approve residencies and fellowships in industrial medical training.

Another matter that must be faced promptly is the workmen's compensation problem. The Council has participated in the planning of a National Workmen's Compensation Conference Committee. The International Association of Accident Boards, labor, management and insurance groups and the U. S. Department of Labor are now included in our conference. A great many of the subjects coming under discussion are medical, such as the simplification and unification of compensation report forms, the problem of improving and policing medical testimony and the problem of disability evaluation.

With respect to rehabilitation, the problem of selective placement is an important segment of the whole rehabilitation question—putting the proper people into the proper kind of jobs. The gradual rise of psychiatrists in industry is interesting.

In reply to a question on what extent the Council on Industrial Health is working to promote industrial hygiene services in the labor and health departments of the states, if he thought much of the future research would be done through those agencies and if more money to help them should be sought, Dr. Peterson stated that from the public health administration aspect there is an enormous amount of work to be done, that if more funds were made available it would be an effective stimulus and that the Council on Industrial Health has taken the position that these matters should be administered by health departments.

Dr. Long commented on a project that has been started in Baltimore for studying the psychogenic aspect of labor-management relations using the technics developed in the Army for determining the individual motives and finding out what motivates the individual and why and how he reacts under certain conditions.

PROCUREMENT AND ASSIGNMENT SERVICE

The Chairman called on Miss Switzer for a statement on the Procurement and Assignment Service for Physicians, Dentists and Veterinarians. Miss Switzer informed the Committee as follows:

June 1946 will see the close of the Procurement and Assignment Service. Most of the local offices have been closed since May. The last meeting of the directing board was held on May 17; there was a meeting at the Navy Department at which Dr. Frank H. Lahey was presented with a medal; we then went to meet the President, who thanked the Board for its work and presented a certificate personally to each member; later in the day we had a meeting with the three Surgeon Generals. At this final board meeting disposition of the records was discussed. Some records will be available to the Committee on National Emergency Medical Service, if they are desired. Most will be destroyed. Some of the basic statistic material will go to the Public Health Service. There is a lot of material which is going to be kept for future reference. The state records will go to the state medical societies if they want them; only one state does not want them. Nothing will be destroyed that the state medical societies want. A history of Procurement and Assignment is being prepared which it is hoped can be produced in pamphlet form.

COMMITTEE ON NATIONAL EMERGENCY MEDICAL SERVICE

Dr. Bortz was asked to tell the Committee something of the plans and activities of the American Medical Association's Committee on National Emergency Medical Service, of which he is Chairman. He presented the following statement:

The House of Delegates of the American Medical Association authorized the Board of Trustees to appoint a committee to study the experiences of doctors in the recent war. That committee was originally entitled "Committee on Military Medical Service." The committee has held three meetings and, after a rather detailed study and consideration of the objectives outlined by the House of Delegates and the Board of Trustees, the members were convinced that a better title would be "Committee on National Emergency Medical Service" because of the fact that in the event of a future emergency medical participation would not be on the basis of purely military personnel. In view of the fact that the data which must be collected are nationwide in scope, it was thought wise to have corresponding committees appointed by the various state medical societies, which has been done.

A great many letters have been received from individuals who were in service voicing, rather strongly, certain opinions, and the committee is at the present time studying these letters.

Our second meeting, some six weeks ago, was held in Washington, at which time we were in conference with officials of the Army, Navy, Public Health Service and Veterans Administration. The third meeting was held yesterday. We are making progress.

SENATE COMMITTEE HEARINGS

Dr. Sensenich stated that on Tuesday morning, June 11, he and some others were to appear before the Committee on Executive Expenditures, headed by Senator Hill, with reference to the recommendations to the President for consolidating scattered government activities and to the creation of a new department, and that this involves the transfer of the Children's Bureau, the Bureau of Vital Statistics, the Public Health Service, the Federal Security Agency and various other activities under a new department. He said that the American Medical Association has long advocated the establishment of a Department of Health with a physician at its head as a cabinet member.

Miss Switzer said that the U. S. Employees' Compensation Commission already is abolished as a commission, and that its functions will be given over to the Federal Security Agency.

REPORT FOR HOUSE OF DELEGATES

On motion duly made, seconded and carried, the Chairman and Secretary of the Committee were requested to prepare a report of the Committee on Postwar Medical Service for submission to the House of Delegates of the American Medical Association at its annual meeting in San Francisco in July. (The report as submitted to the House of Delegates appeared in THE JOURNAL, July 20, p. 914.) The report of the reference committee of the House to which the Committee's report

was referred was adopted by the House of Delegates and was as follows: "Your reference committee approves the report of the Committee on Postwar Medical Service. It further commends this committee for the splendid work done and recommends that it be continued."

CONTINUATION OF COMMITTEE

The Chairman stated that the Board of Trustees of the American Medical Association is anxious that the Committee on Postwar Medical Service be continued, since it is felt that in this committee is represented a forum in which can be discussed the problems of American medicine. He requested the opinions of the committee members as to the desirability of continuing its activities, and it was the consensus that much good might be accomplished by continuance.

Captain Eaton moved that it be recommended to the responsible authority of the American Medical Association that the Committee on Postwar Medical Service be continued. The motion, seconded by General Draper, was carried after an amendment offered by Dr. Henderson that each organization represented be asked to express its opinion was concurred in by representatives of the American College of Surgeons, the American College of Physicians, the American Hospital Association, the Federation of State Medical Boards and others who were present.

The Chairman observed that as time has passed the considerations of the Committee are gradually changing to civilian problems as the problems of war no longer are presented.

CORRESPONDENCE

The Chairman presented for discussion a communication addressed to Major Gen. Paul R. Hawley, medical director of the Veterans Administration, by the executive secretary of the Medical Society of the County of New York protesting a ruling that graduates of foreign medical schools will not be eligible for appointment as attending physicians or for resident type training in Veterans Administration hospitals where residency programs under supervision of Deans' Committees are in effect.

Dr. Long referred to a letter written by General Hawley in which, he said, it was stated that graduates of foreign schools would be eligible if they present evidence from the respective specialty boards that the boards will accept the foreign credentials. Dr. Long thought that, if the foreign graduates are taken into the Veterans Administration with the idea of ultimate certification and the boards then will not accept the credentials, General Hawley's whole purpose is defeated.

The Chairman presented a number of letters from various sources, most of which were in the nature of complaints concerning conditions within the Army or Navy medical departments. Several of the communications presented were complaints or inquiries as to the status of A. S. T. P. and V-12 students with respect to being called into active service. Dr. Lull informed the Committee that the matter is covered in a report recently released to the press which indicates that all those who have received their medical education under the A. S. T. P. or V-12 programs will be required to go on active duty on completion of internship for a period of two years.

INFORMATIONAL REPORTS

U. S. Public Health Service: General Draper gave a summary of the present activities of the Public Health Service. He said there is a serious shortage in the number of physicians connected with the service but that the Public Health Service is determined that the quality of medical care available in the service hospitals shall not be lowered.

War Department, Office of the Surgeon General: Colonel Voegtly presented the following information on the separation from the Army of Medical Department officers:

> For the week ended June 1, 1946 the total number of Medical Corps officers separated from service was 38,539, Dental Corps 10,931, Nurse Corps 43,811. The total number still remaining in service as of June 1 was Medical Corps 13,304, Dental Corps 3,757, Nurse Corps 13,300.

Dr. Long asked how many medical officers the Army would expect to have in service on July 1, 1946, and Colonel Voegtly, although he was not prepared to give the exact figure, thought it would be around 10,000. Dr. Long stated that if the figure of 10,000 medical officers was based on a requirement of seven physicians per thousand men it was, in his opinion, too high a number. Colonel Voegtly expained that a somewhat reduced ratio has been adopted.

Navy Department, Bureau of Medicine and Surgery: Captain Eaton stated that by July 1, 1946 the Navy would have still in service 3,437 medical officers, and that on September 1 the authorized number would be 4,300, which they would not have. He said that the Navy ratio of the number of doctors per thousand men is 0.06 per cent.

CHANGE OF NAME OF COMMITTEE

The Chairman placed before the Committee the suggestion that if the Committee is continued it might be well to change its name so as to convey its future scope more accurately. He asked that the members consider this and be prepared with suggestions for discussion at the next meeting.

TIME AND PLACE OF NEXT MEETING

It was decided to hold the next meeting of the Committee at American Medical Association Headquarters in Chicago at 10 a. m. Saturday, Oct. 12, 1946.

Coming Medical Meetings

American Medical Association House of Delegates Supplemental Session, Chicago, Dec. 9-11. Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Secretary.

Conference of State Secretaries and Editors, Chicago, Dec. 7-8. Dr. George F. Lull, 535 N. Dearborn St., Chicago 10, Secretary.

American Academy of Allergy, New York, Nov. 25-27. Dr. Karl D. Figley, 316 Michigan St., Toledo 2, Ohio, Secretary.

American Academy of Dermatology and Syphilology, Cleveland, Dec. 7-12. Dr. Earl D. Osborne, 471 Delaware Ave., Buffalo, N. Y., Secretary.

American Academy of Pediatrics, Pittsburgh, Nov. 13-16. Dr. C. G. Grulee, 636 Church St., Evanston, Ill., Secretary.

American Association of Railway Surgeons, Chicago, Oct. 29-31. Dr. Raymond B. Kepner, 547 West Jackson Blvd., Chicago 6, Secretary.

American Clinical and Climatological Association, Hershey, Pa., Oct. 21-23. Dr. James Bordley III, Johns Hopkins Hospital, Baltimore 5, Secretary.

American Otorhinologic Society for the Advancement of Plastic and Reconstructive Surgery, New York, Nov. 14. Dr. Norman N. Smith, 291 Whitney Ave., New Haven 1, Conn., Secretary.

American Public Health Association, Cleveland, Nov. 12-14. Dr. R. M. Atwater, 1790 Broadway, New York 19, Executive Secretary.

American Society of Anesthesiologists, New York, Dec. 12. Dr. Curtiss B. Hickcox, 745 Fifth Ave., Room 1503, New York, Secretary.

Association of American Medical Colleges, Edgewater Park, Miss., Oct. 28-30. Dr. Fred C. Zapffe, 5 South Wabash Ave., Chicago, Secretary.

Indiana State Medical Association, Indianapolis, Oct. 29-31. Mr. Ray E. Smith, 23 East Ohio St., Indianapolis 4, Secretary.

International College of Surgeons, United States Chapter, Detroit, Oct. 21-23. Dr. Louis J. Gariepy, 16401 Grand River Ave., Detroit 27, Secretary.

National Society for the Prevention of Blindness, New York, Nov. 25-27. Mrs. Eleanor Brown Merrill, 1790 Broadway, New York 19, Executive Director.

New England Postgraduate Assembly, Boston, Oct. 30-31. Dr. Leroy E. Parkins, 8 Fenway, Boston 15, Chairman Executive Committee.

Oklahoma City Clinical Society, Oklahoma City, Oct. 28-31. Mrs. M. R. Waller, 512 Medical Arts Bldg., Oklahoma City, Executive Secretary.

Omaha Mid-West Clinical Society, Omaha, Oct. 28-Nov. 1. Dr. Roy W. Fouts, 1036 Medical Arts Bldg., Omaha 2, Secretary.

Post Graduate Medical Assembly of South Texas, Houston, Dec. 3-5. Dr. M. B. Stokes, 229 Medical Ats Bldg., Houston, Secretary.

Puerto Rico, Medical Association of, Santurce, Dec. 13-15. Dr. Rafael A. Vilar, P. O. Box 3866, Santurce, Secretary.

Radiological Society of North America, Chicago, Dec. 1-6. Dr. Donald S. Childs, 607 Medical Arts Bldg., Syracuse 2, N. Y., Secretary.

Southern Medical Association, Miami, Fla., Nov. 4-7. Mr. C. P. Loranz, Empire Bldg., Birmingham 3, Ala., Secretary.

Southern Surgical Association, Hot Springs, Va., Dec. 10-12. Dr. Alfred Blalock, Johns Hopkins Hospital, Baltimore 5, Secretary.

Western Surgical Association, Memphis, Tenn., Dec. 5-7. Dr. Warren H. Cole, 1853 W. Polk St., Chicago 12, Secretary.

GOVERNMENT SERVICES

ARMY

NEW CRITERIA FOR RELEASE OF OFFICERS FROM THE SERVICE

The War Department announced September 25 a new separation policy which permits the release of all officers, including those of the Women's Army Corps, who will become eligible under current separation criteria for separation by June 30, 1947 with the exception of certain medical department officers, critical specialists, recent Officer Candidate School graduates and officers with dependents overseas or en route overseas.

A second new policy provides that officers will receive their terminal leave within the period of time for which they had signed, excepting only those in overseas stations who cannot be replaced sufficiently early. Early this year officers on active duty were directed to sign statements as to how long they desired to remain on duty, and they were placed in one of eight categories according to the length of time they desired to remain on duty. The new criteria for release from service take these data into account:

With certain exceptions, category V Medical Corps officers, including A. S. T. P. graduates, will normally be separated on arriving in continental United States for separation on completion of twenty-four months' service. The excepted officers include category V medical Corps officers with primary or secondary classification A, B or C in the following military occupational specialties and who, when assigned to duties using their specialty, will be separated on completion of thirty-six months' service: 3101, 3105, 3106, 3107, 3112, 3125, 3126, 3130, 3139, 3150, 3152, 3153, 3180, 3306 and 3325. Release of such specialties, however, is subject to the right of the surgeon general to retain by individual selection a relatively few critically needed specialists where it is essential to the proper care of patients.

All medical department officers surplus to the requirements of major commands or returned to the Zone of Interior from overseas who are within sixty days of eligibility for release will be separated under the provisions of section II, War Department Circular 290, 1945, as surplus officers.

MEETING OF CONSULTANTS TO ARMY MEDICAL LIBRARY

The Association of Honorary Consultants to the Army Medical Library held its third annual meeting in Washington October 4-5. More than four score leaders in medicine and the medical sciences serve as honorary consultants. Among the problems discussed were plans for a new library building, handling of the rare book collection and avoidance of duplication in federal libraries. The opening meeting was at the library, Seventh Street and Independence Avenue southwest, and the remaining sessions were at the Hotel Statler.

Major Gen. Norman T. Kirk, Surgeon General of the Army, and Dr. John F. Fulton, president of the association, opened the meeting with short talks. The remainder of the first morning was devoted to committee meetings and a tour of the library. At a dinner meeting on the opening day the speakers were General Kirk; Col. Leon L. Gardner, director of the Army Medical Library; Professor Max H. Fisch of the University of Illinois, former chief of the medical history division of the library, and Dr. Reginald Fitz, lecturer on historical medicine at Harvard University.

The morning session on October 5 included addresses by Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL; Dr. Luther H. Evans, librarian of Congress; Wyllis E. Wright, army medical librarian; Miss Mary Louise Marshall, librarian of Tulane University School of Medicine; Dr. Chauncey D. Leake of the University of Texas School of Medicine, vice president of the association, and Colonel Gardner. Col. Harold W. Jones, former director of the library, secretary-treasurer of the association, is in charge of the arrangements for the two day program.

Prosecution of plans for a new home for the library and its more than 1,000,000 volumes was the most important business on the consultants' program. The library is still housed in an outmoded, non-fireproof structure built in 1887 which cannot be expanded further. A site on Capitol Hill near the Library of Congress has been selected, but funds for architectural plans only have been appropriated to date by Congress. It is estimated that the proposed new building will require an allotment of $10,000,000.

PATHOLOGISTS HONOR COLONEL ASH AND THE ARMY INSTITUTE OF PATHOLOGY

The American Society of Clinical Pathologists adopted a resolution made public October 1 which stated, in part, "The Army Institute of Pathology has contributed immeasurably to the increasing knowledge in the medical field, particularly that of pathology, and has reflected credit on the Army Medical Department and the United States Army, and has fostered a military-civilian liaison that was nothing short of priceless in World War II. The leadership for these far reaching projects was from 1937 to the present vested in Col. James E. Ash, from whose inspiration, judgment and scientific acumen stemmed the success of many of these projects."

The fellows of the American Society of Clinical Pathologists "record their appreciation of the achievements of the Army Institute of Pathology and express a profound sense of appreciation of the valuable contributions of Colonel Ash to the advancement of knowledge in the field of pathology."

THE GORGAS MEDAL AWARDED

At a dinner given in his honor in Detroit October 9, Brig. Gen. Raymond A. Kelser, formerly of the U. S. Army Medical Department, was awarded the Gorgas Medal for his work in eradicating rinderpest, a disease of cattle, in the Philippine Islands, making it possible for the Filipinos to have their own domestic milk supply. This medal is sponsored by Wyeth Incorporated of Philadelphia and is awarded annually by the Association of Military Surgeons of the United States for outstanding work in preventive medicine for our armed services. The medal carries with it an honorarium of $500.

Brigadier General Kelser during World War II served as director of the veterinary division in the Surgeon General's Office and is widely known for his research work, particularly the discovery in 1932 that equine encephalomyelitis is transmitted by mosquitoes, a scientific achievement of great importance. He is the author of a textbook on veterinary bacteriology and of many scientific articles in the field of immunology. In 1942 he was awarded the twelfth International Veterinary Congress prize and recently the Distinguished Service Medal by the War Department. General Kelser retired from active service in the Army a few months ago and is now dean of the College of Veterinary Medicine and professor of bacteriology at the University of Pennsylvania.

MEDICAL DEPARTMENT EXHIBIT

The mammoth exhibit of the Army Medical Department which had its première at the annual session of the American Medical Association in San Francisco in July was given its first public showing in the East at the annual convention of the American Hospital Association in Philadelphia September 30-October 3. Some features of the exhibit were eliminated because of lack of space. From Philadelphia the exhibit will be taken to Detroit for the annual meeting of the Association of Military Surgeons, October 9-11, and early next year it is scheduled for presentation in the Smithsonian Institution, Washington, D. C.

ARMY AWARDS AND COMMENDATIONS

Brigadier General Raymond W. Bliss

The War Department recently awarded the Legion of Merit to Brig. Gen. Raymond W. Bliss, Deputy Surgeon General, Washington, D. C., who, the citation reads, "distinguished himself as Surgeon, Eastern Defense Command and First Army, from June 1942 to June 1943. He organized and supervised the army medical installations, services and personnel of the widely dispersed elements, both continental and at overseas bases, of this command."

Lieutenant Colonel James N. Greear Jr.

The Legion of Merit was recently awarded to Lieut. Col. James N. Greear Jr., Washington, D. C., who "rendered distinguished service as chief of the eye, ear, nose and throat service, Valley Forge General Hospital, Phoenixville, Pa., from October 1943 to February 1945. Through his outstanding background, tact and professional ability, Colonel Greear contributed greatly to facilitating the high standard of care rendered blind patients. . . ."

Major Paul E. Gutman

The Commendation Ribbon was recently awarded to Major Paul E. Gutman, Bronx, N. Y. The citation read, in part, "Your excellent service in the care and treatment of the casualties which were received at the Station Hospital, Fort Hancock, in the early morning of Jan. 3, 1944 following the explosion of the S. S. *Turner*, . . . you were charged with the responsibility of supervising all medical and surgical care. . . . The patients are all much improved and off the serious or critical lists. The results were due not only to the excellent care at the time of their admission to the hospital but to the follow-up of these cases and the anticipation and treatment of the complications before they occurred. You are to be commended also for your preparation by means of conferences with other officers and review of the correct procedure in the care of burn cases only a short time before the disaster occurred." Dr. Gutman graduated from New York University College of Medicine, New York City, in 1930.

Major Lucian A. Smith

The War Department recently awarded the bronze star to Major Lucian A. Smith, Rochester, Minn., for meritorious achievement in New Guinea from April 22, 1944 to May 15, 1945 in connection with military operations. The citation stated that, "despite a shortage of personnel and clinical facilities, he succeeded after diligent research in developing a method by which early diagnosis and effective therapy of various types of dysenteries were made possible. As a result, the speedy recovery and return to duty of many afflicted personnel was materially facilitated. Entrusted with the care of a large number of repatriated internees in extreme stages of malnutrition, he succeeded through long and arduous efforts in restoring them to health although many of them were elderly men and women as well as young children. By his superior medical knowledge and exemplary perseverance, Major Smith contributed substantially to the conservation of vital manpower."

MISCELLANEOUS

ESTIMATE OF NUMBER OF NURSES NEEDED

The Committee on Statistical Research of the National Nursing Council, New York, estimates that 359,500 registered professional nurses are needed in the United States and that 317,800 are available. The difference between the two figures, 41,700, the report states, probably does not indicate total nurse shortages in the country. The "available" nurses include two groups listed as only "potentially available"—the 37,900 nurses released by the Army and Navy since Sept. 1, 1945 and the estimated 35,600 students graduated from schools of nursing during 1946. It is not known what portion of these 73,500 nurses are actually at work in their profession.

Estimated Numbers of Nurses Needed in the Different Places of Service

Place of Service	Estimated Nurses Needed		
Federal Services			24,200
Army		8,500	
Navy		2,500	
U. S. Public Health Service		1,600	
Commissioned	400		
Civil Service	1,200		
Veterans Administration		9,800	
Office of Indian Affairs		900	
Other federal agencies		900	
Non-Federal Services			335,300
Hospital		190,900	
General and allied special hospitals	151,200		
Nervous and mental hospitals	24,900		
Tuberculosis hospitals	13,800		
Convalescent homes, hospital departments of institutions and "others"	1,000		
Private duty		91,400	
Public health		28,000	
Industrial		10,000	
Other fields		15,000	
Estimate of Total Nurses Needed			359,500

The federal services, including Army and Navy, now employ 26,300 nurses. Nurses employed in specific fields include 114,300 in hospitals, 20,700 in public health and 9,000 in industry. In addition it is estimated that 59,000 nurses are engaged in private practice and 15,000 in other areas.

It may be noted in the accompanying table that 190,000 nurses are needed in hospitals as compared with 114,300 employed in them, indicating a shortage of 76,600 in hospitals alone. The amount of the shortage of nurses in hospitals may reflect reluctance on the part of veteran nurses to return to hospital work. The figures exclude student services. Without the service now given by students, an additional 74,300 graduate nurses would be needed in hospitals.

Estimates of hospital needs have been based on studies of administrative measures for nursing service of registered professional nurses in hospitals and on standards of nursing service for particular types of hospitals set by specialists. Wherever necessary the standards were adjusted to provide for an eight hour working day and a work year of two hundred and eighty days per nurse.

A ratio of 1 public health nurse to 5,000 population was the standard which the committee used in estimating public health nursing needs. Many authorities contend that such a standard is much too conservative. The number of industrial nurses employed on Jan. 1, 1945 was used as the number needed, since the industrial situation is now fluctuating to the extent that it is impossible to apply standards. It seemed conservative to estimate that 15,000 nurses were needed in "other fields" in the entire United States, since 3,000 nurses are employed in doctors' offices in New York City alone.

GRADUATE TRAINING FOR NURSES OF OTHER COUNTRIES

A program announced recently by the chief nurse for UNRRA will bring to New York City for modern training more than 100 graduate nurses from China, Czechoslovakia, Italy, Poland and Yugoslavia, while another 40 from Austria and Greece will undertake similar studies in England. A contract has been agreed to between UNRRA and Dr. Edward Bernecker, commissioner of the New York City Department of Hospitals, under which up to 100 nurses will be housed, fed and given three months of experience in special services in the Departments of Hospitals, followed by a one month special course in methods of training.

The professional programs for the students call for one month of experience in the newer technics of medical nursing, one month in tuberculosis nursing, one month in communicable diseases, and one month for a course on methods of teaching. The nurses will then return to their own countries to practice and teach what they have learned.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Harold Brunn Retires.—Dr. Harold Brunn on September 24 announced his retirement and plan to study painting. Dr. Brunn was for many years clinical professor of surgery at the University of California Medical School, San Francisco, and established the Harold Brunn Institute for Cardiovascular Research.

Unidentified Outbreak of Disease in Infants.—On September 25 the Oakland Health Department closed and quarantined the maternity ward and nursery of Providence Hospital in an effort to halt a mysterious outbreak of disease which already has killed 6 of 17 babies afflicted with it since September 15. The order, issued by Dr. Stanford F. Farnsworth, Berkeley, health director, put more than 40 hospital beds and 50 infant cribs under quarantine and forced hospital officials to turn away all expectant mothers who have booked beds for the next three weeks, it was stated. Dr. Farnsworth said the disease had not been completely classified and that its main symptom was diarrhea.

CONNECTICUT

Meeting of Electroencephalographers.—The fourth meeting of the Eastern Association of Electroencephalographers will be held at the Yale University School of Medicine, New Haven, October 26. Among the speakers will be Dr. Margaret A. Lennox, New York, on "Some Effects of Deep Brain Lesions on the Electroencephalogram"; Dr. Frederick Redlich, New York, "Some Other Uses of the Electroencephalograph," and Mary A. B. Brazier, "A Review of the Electroencephalographic Findings at Various Levels of O_2 and CO_2."

University Aids Veterans' Dependents.—The provision of medical care for dependents of veterans now enrolled as students at Yale University, New Haven, is envisaged in a health program announced September 19 by the university officials, according to the New York *Times*. The plan provides for both clinical and home medical services at nominal fees. A panel of physicians would be set up to which patients would be referred by the Yale department of university health. In addition the wives and children of Yale veteran students would be admitted to the clinics of the Grace-New Haven Community Hospital for standard clinic fees. Maternity cases would be taken care of at the Prenatal Clinic. Patients requiring hospitalization would be admitted to the Grace-New Haven Hospital. The university on September 25 began the inoculation of its faculty, students and employees with the influenza vaccine developed by the army.

ILLINOIS

Harold Swanberg Honored.—Dr. Harold Swanberg, Quincy, was recently presented with the Distinguished Service Award of the Mississippi Valley Medical Society, which he is credited with founding in 1935. Dr. Swanberg is a past president of the Adams County Medical Society and the Illinois Radiological Society and secretary of the Mississippi Valley Medical Editors' Association. He founded and has been active in the administration of the *Quincy Medical Bulletin*, the Adams County Medical Library and the annual fall clinical conference, which he converted into the Mississippi Valley Medical Society. He founded the Swanberg Medical Foundation and has contributed generously to its support.

Chicago

Chauncey Leake to Address Joint Meeting.—Chauncey D. Leake, Ph.D., vice president of the University of Texas Medical Branch, Galveston, will speak on "The Centennial of Ether Anesthesia" at a joint meeting of the Institute of Medicine and the Society of Medical History of Chicago, November 22, at the Palmer House.

Rongetti Seeks Medical License.—Amante Rongetti of 2000 Van Buren Street, who served eight years in Joliet prison for manslaughter by abortion and twenty-eight months in Leavenworth penitentiary for narcotics act violation, filed a petition in Superior Court to regain his physician's license, according to the Chicago *Tribune*, October 4. He asked a writ of mandamus against Frank R. Thompson, director of the state department of registration and education, asserting that the pardon granted in May 1942 by Governor Green restored all his rights.

Brief Psychotherapy Council.—The third meeting of the Brief Psychotherapy Council, sponsored by the Chicago Institute for Psychoanalysis, will be held at the Stevens Hotel, October 18-19. Among the speakers will be Dr. Adelaide M. Johnson, on "A Case of Migraine" and Dr. Franz G. Alexander, "A Case of Peptic Ulcer and Personality Disorder." A symposium on the "Psychiatric Out-Patient Clinic of the Future" will be held with Dr. Roy R. Grinker as chairman. At a luncheon session Dr. Robert H. Felix, medical director, U. S. Public Health Service, Washington, D. C., will be chairman of a discussion of the National Mental Health Act. At a dinner a report of a medical mission to Czechoslovakia was presented with William F. Ogburn, Ph.D., as chairman.

New Chairman of Physiology Department.—Dr. John S. Gray, associate professor of physiology, Northwestern University Medical School, has been named professor and chairman of the department of physiology, succeeding Dr. Andrew C. Ivy, who resigned to become vice president in charge of the Chicago Professional Colleges of the University of Illinois (THE JOURNAL, July 13, p. 928). Dr. Gray received his Ph.D. in 1936 at Northwestern and an M.D. in 1946. He was first appointed to the faculty of medicine in 1935 and served continuously in the department of physiology until he went to Randolph Field in June 1942. While in Texas as a civilian in government service at the Army Air Force School of Aviation he did research in aviation medicine until December 1945, when he returned to the medical school.

Committee to Combat Alcoholism.—The Chicago Committee on Alcoholism was organized at the Institute of Medicine of Chicago on October 1. Dr. Anton J. Carlson, professor emeritus of physiology, University of Chicago School of Medicine, was named chairman of the organizing committee. Other members include:

Walter O. Cromwell, Juvenile Protection Association, vice chairman.
Alexander Rotchan, Council of Social Agencies, secretary.
Dr. Andrew C. Ivy, vice president in charge of the Chicago Professional Colleges of the University of Illinois.
Dr. David Slight, State Veterans Rehabilitation Commission.
Dr. David B. Rotman, director of the psychiatric institute, Municipal Court.
Dr. William F. Petersen, chairman of the board of governors of the Institute of Medicine.

The first step of the group will be to establish an information center. The committee will also carry on research on the causes of alcoholism and, where necessary, provide further facilities for its treatment. In attendance at the initial meeting were university faculty members, physicians, sanatorium workers and leaders of such groups as Alcoholics Anonymous, the Salvation Army and the Council of Social Agencies.

Report of Tuberculosis Study.—In an interim report Dr. Arthur W. Newitt, U. S. Public Health Service, recommended drastic revision in the control of Chicago's tuberculosis program. The report constitutes the second part of a "continuing audit" of the health facilities of Chicago and Cook County made by the public health service at the request of Mayor Kelly and Clayton F. Smith, president of the board of county commissioners. Among the recommendations are:

Employment of a full time tuberculosis control officer for Chicago.
A change in the Glackin law to compel hospitalization of tuberculosis patients.
Installation of 2,300 more beds for tuberculous patients to meet the minimum standard set by the National Tuberculosis Association requiring 2½ beds for each annual death from the disease.
Revision of state regulations to forbid contact of tuberculous patients with persons of all ages rather than only with children under 16 as at present.
Civil service regulations should require accurate job descriptions for all persons engaged in tuberculosis control and specify the minimum qualifications as to education and experience for each appointment.

The report stated that during 1945 Chicago had 1,837 deaths from tuberculosis, including 1,178 white and 659 nonwhite. The nonwhite deaths were 95 per cent Negro and comprised 35.8 per cent of the total fatalities, although Negroes make up only one twelfth of Chicago's population. Chicago had an overall death rate of 62.4 per hundred thousand of population and ranked twenty-fourth highest in a list of ninety-two American cities of 100,000 or more population in the 1939-1941 death rates ascribed to the disease in this country, the report showed.

MARYLAND

Ether Celebration at Maryland University.—The department of pharmacology, University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, held a special program in the Bressler Library, October 16, to observe the one hundredth anniversary of the first administration of anesthetic ether, with Dr. John C. Krantz Jr., professor of

pharmacology, presiding. A feature of the program was the presentation of a painting showing the first administration of anesthetic ether. Stanley M. Bell is the artist, and the portrait is based on a daguerreotype. The donor is Henry A. B. Dunning, Ph.D., Baltimore. The portrait was unveiled by Constance Black, anesthetist, Baltimore. Among the speakers were:

Dr. Henry E. Sigerist, professor of the history of medicine, Johns Hopkins University, Baltimore, Surgery Before Anesthesia.
J. Ben Robinson, D.D.S., dean, University of Maryland School of Dentistry, Dr. W. T. G. Morton and Ether.
Dr. Henry S. Ruth, editor, *Anesthesiology*, Philadelphia, Anesthesia Today and Tomorrow.

MASSACHUSETTS

The Cutter Lecture on Preventive Medicine. — Sir Lionel Whitby, regius professor of physic in the University of Cambridge, England, will deliver the Cutter Lecture on Preventive Medicine, November 6, in Amphitheater D of Harvard Medical School, Boston. His subject will be "The Hematological Effects of Irradiation." The lectures have been held since 1912.

MICHIGAN

Hospital-Medical School Affiliation Offers Opportunities to Residents.—Sixteen Michigan hospitals have affiliated or are in the process of affiliating with a program of medical education at the University of Michigan Medical School, Ann Arbor, to give additional graduate training to resident physicians in hospitals, it was announced October 1. Dr. Charles F. Wilkinson Jr., assistant professor of internal medicine and program coordinator, said that from twenty-five to thirty doctors who already have completed two years of their resident training were to begin from six to twelve months of study in the basic medical sciences at the medical school, October 7. Hospitals affiliated or in the process of affiliating are St. Mary's Mercy, Blodgett Memorial and Butterworth, Grand Rapids; Saginaw General; Leila Y. Post Montgomery and Community, Battle Creek; St. Joseph's Mercy and University, Ann Arbor; Bronson Methodist, Kalamazoo; Hurley, Flint; Munson, Traverse City; Hackley, Muskegon; Foote Memorial, Jackson, and Mount Carmel Mercy, Grace and Harper, Detroit. Dr. Wilkinson explained that other Michigan hospitals may yet affiliate with the program and that an increasing number of doctors are expected to participate. Affiliating hospitals must have an active teaching program and meet other minimum requirements set by the medical school. Under the decentralized program, doctors spend two years at affiliated hospitals as interns and assistant residents and then rotate to the medical school for advanced study in the basic medical sciences. After six to twelve months of study the doctors return to their original hospitals for at least one additional year as residents in their clinical fields. The program is said to be the first of its kind to be extended on a statewide basis. Under the program, facilities for training hospital resident physicians as specialists will be greatly enlarged. Funds for the program are provided by the W. K. Kellogg Foundation, which has allotted the medical school $105,000 for a three year period.

NEW YORK

Niagara Academy of Medicine. — On March 14 the Niagara Falls Academy of Medicine will hold its first clinical day at the Niagara Hotel. Dr. Vincent D. Leone is chairman, and Dr. Joseph C. Elia, both of Niagara Falls, is handling the public relations aspect. Officers of the academy, which was formed about 1916, include Drs. Joseph V. Farugia, president; Isadore I. Sidenberg, vice president, and Victor L. Pellicano, secretary-treasurer, all of Niagara Falls. The academy now has a membership of about 100.

Schoharie County Establishes Health Department.—Schoharie has become the second county in the state to establish a county department of health this year, taking advantage of public health legislation passed in 1946. Rensselaer County was the first to organize under the new provisions (THE JOURNAL, October 12, p. 342). Dr. Edward S. Godfrey Jr., Albany, state commissioner of health, has approved a request from the Schoharie County Board of Supervisors for formation of the county department. There will be a county board of health of seven members, three of whom must be physicians and one a member of the board of supervisors.

Personal.—Col. Austin J. Canning, Utica, formerly commanding officer and chief surgeon at Rhoads General Hospital, Utica, has been named acting director of the New York State Reconstruction Home, West Haverstraw, effective August 15. Colonel Canning has retired from the army at his own request to accept the state position. He succeeds Dr. Kenneth Landauer, Geneva, who has been named director of medical care for the National Foundation of Infantile Paralysis.——Dr. Berwyn F. Mattison, Albany, district state health officer with offices in Kingston, has been appointed city health commissioner of Yonkers, effective September 1.——Dr. George B. Landers started a four month leave of absence, August 31, from his position as medical director of Highland Hospital, Rochester; his retirement from the post, which he has held for twenty-five years, will be effective January 1.——Dr. Frederick E. Squires, Livonia, observed the eighty-first anniversary of his birthday and his fiftieth year of practice, August 17.

New York City

Howard Craig Named Director of Academy of Medicine.—Dr. Howard R. Craig has been appointed director of the New York Academy of Medicine, succeeding Dr. Herbert B. Wilcox, who resigned October 1. Dr. Craig graduated at Cornell University Medical College in 1919 and has been a fellow of the New York Academy of Medicine since 1927. Dr. Wilcox has served as director of the academy since 1939.

Talks to the Laity.—The twelfth series of Lectures to the Laity will open at the New York Academy of Medicine October 31 with a talk by Major Gen. Norman T. Kirk on "The Role of the Medical Man in War." This will be the Linsly R. Williams Memorial Lecture. Others in the series will be:

Arthur K. Solomon, Ph.D., Boston, November 14, The Atom in Medicine.
Dr. Rene A. Spitz, December 12, Are Parents Necessary?
Dr. Nolan D. C. Lewis, January 9, What the Wars' Experiences Have Taught Us in Psychiatry.
Dr. Howard W. Haggard, New Haven, Conn., January 23, American Pioneering in Psychiatry.
René J. Dubos, Ph.D., Boston, February 13, Anti-Infectious Agents of Natural Origin (the George R. Siedenburg Memorial Lecture).

Friday Afternoon Lectures.—The twenty-first series of Friday afternoon lectures will open at the Academy of Medicine, November 1, with a talk by Dr. Harold G. Wolff on "Headache." Others in the series will be:

Dr. Walsh McDermott, November 8, The Latest Developments in the Use of Penicillin and Streptomycin.
Dr. George S. Perrott, November 15, Implications of Selective Service Rejections.
Dr. George A. Perera, November 22, Addison's Disease and Relation of Adrenal Cortex to Hypertension.
Dr. Zacharias Bercovitz, December 6, Colitis.
Dr. John R. Paul, New Haven, Conn., December 13, Infectious Mononucleosis.
Dr. Anton J. Carlson, Chicago, January 3, The Treatment of Chronic Alcoholism by the General Practitioner.
Dr. Marion B. Sulzberger, January 10, Recent Advances in the Management of Skin Diseases.
Dr. Harry Gold, January 17, Recent Advances in Therapeutics.
Dr. Paul Klemperer, January 24, Diseases of the Collagen System.
Dr. William G. Lennox, Boston, January 31, Epilepsy and Allied Conditions.
Dr. Robert S. Hotchkiss, February 7, Sterility in the Male.
Dr. Isidor C. Rubin, February 7, Diagnostic Procedures in the Investigation of Sterility in the Female: Evaluation of Their Relative Importance.
Dr. Ephraim Shorr, February 14, Some Problems of Menstruation and the Menopausal State.
Dr. Sidney C. Werner, February 28, The Use of Male Sex Hormones in Clinical Medicine.
Dr. George E. Daniels, March 7, Psychosomatic Medicine.
Dr. Nathan Rosenthal, March 14, Anemias, with Especial Reference to Treatment.
Dr. John Scudder, March 21, Critical Evaluation of the Uses and Dangers of Transfusions.
Dr. Lloyd F. Craver, March 28, Recent Advances in the Treatment of Lymphomas and Leukemias.
Dr. John E. Scarff, April 11, Back Pain of Nervous Origin.
Dr. Henry H. Jordan, April 18, Back Pain of Psychosomatic Origin.

Howard Rusk to Head New Department.—Dr. Howard A. Rusk, who established the Army Air Forces rehabilitation program in 1942 and now is associate editor of the New York *Times* and consultant in medical rehabilitation to the medical director of the Veterans Administration, has been named to head a new department of rehabilitation and physical medicine at the New York University College of Medicine, it was announced October 9. The department will train all students through their medical college years in what is termed the "third phase of medical care," that is, preparing the patient to go from "the bed to the job." The department is an outgrowth and expansion of a division of physical medicine set up early last year as a part of the department of medicine under a grant of $250,000 from the Baruch Committee on Physical Medicine in 1944. Dr. George G. Deaver, clinical professor of physical medicine, is to continue as head of the physical medicine division of the new department. The new unit will cooperate closely with the city department of hospitals in establishing a supervising rehabilitation program in all city hospitals. Forerunner of the programs planned for other hospitals is that of Bellevue, where severely disabled persons have been

given rehabilitation treatment and training under the direction of Dr. Deaver for the past two years. A special rehabilitation program has recently been inaugurated at Seaview Hospital on Staten Island, and plans are under way to start other special rehabilitation projects at Goldwater Memorial Hospital.

OHIO

Louis Karnosh Promoted.—Dr. Louis J. Karnosh, associate clinical professor of neurology, Western Reserve University School of Medicine, Cleveland, has been appointed to full professorship, newspapers reported September 13. Dr. Karnosh, who has been head of the neuropsychiatric department at the City Hospital since 1923, has also been made head of the newly created department of neuropsychiatry at the Cleveland Clinic.

Dr. Ecker to Lecture on Immunology in Europe.—Enrique E. Ecker, Ph.D., professor of immunology, Western Reserve University School of Medicine, Cleveland, left October 3 for Europe to deliver eleven lectures on various phases of immunology and bacteriology to medical students and faculties. On October 15 under the auspices of the Institute of Scientific Investigations of Madrid, he lectured at the University of Madrid. Other universities on his itinerary include the University of Ghent in Belgium and one or two universities in the Netherlands, depending on available time. He was invited to Ghent by Dr. C. Heymans, professor of physiology there, and to Utrecht by Dr. W. Aeg. Timmerman, director of the government laboratories of health in that city.

OREGON

Frank Queen Joins Oregon Faculty.—Dr. Frank B. Queen, Denver, has been appointed professor of pathology at the University of Oregon Medical School, Portland, and director of the state cancer control program, effective September 20. As director of the cancer program he will serve under the joint auspices of the medical school and the Oregon division of the American Cancer Society. Dr. Queen, who graduated at Washington University School of Medicine, St. Louis, in 1929, has served on the faculties of the universities of Rochester, Pennsylvania, Colorado and Northwestern.

PENNSYLVANIA

Philadelphia

Personal.—Dr. Alfred C. LaBoccetta has been appointed superintendent and medical director of the Philadelphia Hospital for Contagious Diseases.——Dr. Frederick W. Deardorff is the new medical director of the Philadelphia Transportation Company.

New Head of Medicine Department.—Dr. Richard A. Kern, who was released from the navy in March 1945 after four years' service, has been appointed professor and head of the department of medicine at Temple University School of Medicine. He succeeds Dr. Charles L. Brown, who recently became dean of the Hahnemann Medical College and Hospital of Philadelphia. Dr. Kern has been serving as professor of clinical medicine at the University of Pennsylvania School of Medicine.

Special Society Elections.—Dr. LeRoy M. A. Maeder was elected president of the Philadelphia Psychoanalytic Society, June 15. Other officers include Dr. George W. Smeltz, Pittsburgh, vice president, and Dr. Robert S. Bookhammer, Norristown, Pa., secretary-treasurer.——Dr. George L. Whelan is the new president of the Philadelphia Laryngological Society. Other officers include Dr. Valentine M. Miller, vice president; Dr. Thomas F. Furlong Jr., Ardmore, treasurer, and Dr. William J. Hitschler, secretary.

Health in Industry.—The Commission on Industrial Health and Hygiene of the Medical Society of the State of Pennsylvania will hold a conference on health in industry at the Bellevue-Stratford Hotel, November 14. "What Should Employee and Employer Expect of an Industrial Health Program in the Plant?" and "What Are the Benefits of an Industrial Health Program?" will be the subjects of a panel discussion with the following speakers:

Mr. Henry D. Gordon, Armstrong Supply Company, Employee.
Mr. William Waldeisen, president, Williamsport Narrow Fabric Company, Williamsport, Pa., Employer.
Dr. Glenn S. Everts, Melrose Park, Pa., medical consultant to five small plants, Industrial Physician.
Mr. Frank J. Willard, Industrial Hygiene Laboratory, Bureau of Industrial Hygiene, Pennsylvania Department of Health, Industrial Hygienist.
Mr. Al J. Petrini, Petrini Realty and Insurance Company, Sharon, Pa., Insurance Carrier.
Mrs. Mangene, Industrial Nurses Association, Industrial Nurse.

Mr. John P. Roche, assistant to the president, Oliver Iron and Steel Corporation, Pittsburgh, will be the moderator. The dinner speakers will be Dr. Victor Heiser, New York, consultant, National Association of Manufacturers, "How a Plant Medical Service Can Help Industry"; Mr. C. E. Noyes, manager, Williamsport Trade Association, "How to Procure a Plant Medical Service." Dr. Charles F. Long is chairman of the Commission on Industrial Health and Hygiene.

Pittsburgh

Personal.—Dr. William L. Cook Jr. has been appointed assistant director of the department of industrial hygiene, University of Pittsburgh School of Medicine. Dr. Cook was assistant director and later director of the occupational health division, Office of the Surgeon General, U. S. Army, during World War II.

UTAH

Faculty News.——Dr. Richard H. Young, formerly associate professor of medicine and recently director of the student health service of Northwestern University Medical School, Chicago, has been appointed dean of the University of Utah School of Medicine, Salt Lake City (THE JOURNAL, August 17, p. 1375). Dr. Young assumed his duties September 15. Dr. Hyrum L. Marshall, who has been acting dean, will now be enabled to devote full time to his position as professor of public health and preventive medicine and director of the student health service. The Miles Laboratories, Elkhart, Ind., has made a grant-in-aid of $7,075 for blood grouping studies and research on antibiotics in Utah plants under the direction of Gustave A. Matson, Ph.D., associate professor of bacteriology. The U. S. Public Health Service has made the following grants-in-aid for research in the departments indicated: $26,210 for the study of pathogenesis of the anemia of infection under the direction of Dr. Maxwell M. Wintrobe of the department of medicine; $7,500 for an experimental study of surgical shock under the direction of Dr. Phillip B. Price, department of surgery; $24,500 for the study of the physiology and therapy of convulsive seizures under the direction of Dr. Louis S. Goodman of the department of pharmacology, and Horace H. Davenport, Ph.D., and James E. P. Toman, Ph.D., of the department of physiology.

WEST VIRGINIA

Changes in Health Officers.—Dr. William E. McIlvaine, Moundsville, has been named health officer of Marshall County, succeeding Dr. William G. C. Hill, Moundsville, who has moved to Live Oak, Fla.——Dr. Thomas C. Sims, Charleston, has been named health officer for district number one, comprising Braxton, Clay, Nicholas and Webster counties, with headquarters at Sutton.

Robb Spray Retires.—Robb S. Spray, Ph.D., has retired as professor of bacteriology at the West Virginia University School of Medicine, Morgantown, where he has been a member of the faculty for twenty-five years. He has been named professor emeritus. John M. Slack, Ph.D., who has been in the Sanitary Corps of the army for the past four years, has been named to fill the vacancy.

WISCONSIN

Memorial Meeting.—The Medical Veterans Association of Milwaukee held a meeting September 4 in memory of the following colleagues who died in service:

Commander Charles J. Allen.
Lieut. Commander George W. Fox.
Captain Anthony J. Gramling.
Major Jacob J. Horowitz.
First Lieut. William H. Millman.
Captain John H. Pepin.

New Surgical Group.—On September 14 the Wisconsin Surgical Society was organized at a meeting in Milwaukee. With fifty founder members, the following were elected to office: Drs. Frank G. Connell, Oshkosh, president; Russell M. Kurten, Racine; Warner S. Bump, Rhinelander, secretary-treasurer, and Frank D. Weeks, Ashland, recorder.

HAWAII

Territorial Medical Election.—At the fifty-sixth meeting of the Hawaii Territorial Medical Association Dr. Robert B. Faus, Honolulu, was named president-elect and Dr. Jay M. Kuhns, Lihue, was installed as president. Other officers include Dr. Harry L. Arnold Jr., Honolulu, secretary, and Dr. Frederick K. Lam, Honolulu, treasurer.

GENERAL

Another Medical Broadcast.—The U. S. Treasury Department through the Savings Bonds Division announces a transcribed radio program in its "Treasury Salute" series of stories from "The American Notebook" during the week of November 23 which should be of interest to physicians. This chapter is entitled "On Call" and is a dramatization of the story of several doctors in a small California town. The advance publicity indicates that it is a tribute to the medical profession. The time of broadcasting will vary with the locality. Inquiries can be made of local radio stations. The program can be identified by asking for disk 396.

Allergy Meeting.—The American Academy of Allergy will hold its annual convention at Hotel Pennsylvania, New York, November 25-27 inclusive. All physicians interested in allergic problems are cordially invited to attend the sessions as guests of the academy without payment of the registration fee. The program has been arranged to cover a wide variety of conditions in which allergic factors may be important. Papers will be presented dealing with the latest methods of diagnosis and treatment as well as with the results of investigation and research. Advance copies of the program may be obtained by writing to the chairman of arrangements, Dr. Horace S. Baldwin, 136 East 64th Street, New York, prior to November 10.

Dr. Rorem Goes to Philadelphia.—C. Rufus Rorem, LL.D., Chicago organizer and since 1937 director of the Blue Cross Commission of the American Hospital Association, national coordinating agency for the Blue Cross Plan of the United States and Canada, has resigned, effective December 31, to become executive director of the recently formed Hospital Council of Philadelphia. The objectives to which Dr. Rorem will devote himself to achieving in his new post are administrative economies in hospitals through improved accounting, personnel and purchasing procedures; emphasis on the role of the hospital as a medical service center; development of a long-run program for financing capital investment and current service, and a sound public relations program.

Narcotic Forms Stolen.—The Office of the Commissioner of Narcotics, Washington, D. C., announced that official narcotic order forms serial numbers N-972039 and N-972040 were stolen, together with a quantity of narcotic drugs, from the Veazey Drug Company number 9, 1400 North Lottie Street, Oklahoma City, September 2. These order forms, which are known to be in possession of persons not entitled thereto, may be presented for filling. Importers and manufacturers of and wholesale dealers in narcotics are cautioned not to fill either of them and, if possible, to forward to Commissioner of Narcotics at once either order presented. If unable to forward the form, the names and addresses appearing thereon and the name and quantity of each item of narcotic drugs requested should be forwarded.

Aid for Greece.—Dr. John Caminopetros and Dr. Spyros Docoumetzidis are in the United States on a special mission to enlist the aid of the medical profession and scientists in building up medical and scientific activities in Greece. It is stated that books and equipment are needed to restore educational facilities to help combat malaria, dysentery and typhoid, which are of common occurrence in the country. Bacillary dysentery is now a major cause of infant mortality in Greece. Any one wishing to assist may communicate with either physician, in care of the Medical and Surgical Relief Committee of America, 420 Lexington Avenue, New York, or by writing directly to the Pasteur Institute, Athens, Greece. Dr. Caminopetros is chief of service, Pasteur Institute, Athens, Greece, and vice president, Greek Medical Association, Athens, Greece.

Association of Medical Illustrators.—The first annual convention of the Association of Medical Illustrators was held at Jefferson Medical College, Philadelphia, September 23-26. In addition to discussions on professional relations, ethics and publicity, association insignia and various reports, other speakers included Mr. Walter Kahoe, J. B. Lippincott Company, on "Medical Illustrations from the Publisher's Point of View" and Mr. L. R. Benedict, Phototype Engraving Company, "Engraving and Printing of Medical Illustrations." The officers are Mr. Tom Jones, Chicago, president; Mr. Willard C. Shepard, Philadelphia, vice president; Muriel McLatchie, Boston, secretary, and Elizabeth Brodel, New York, treasurer. The association was created at a meeting July 16-19 (THE JOURNAL, Aug. 4, 1945, p. 1040), but it was decided to continue the officers, since this was the first annual session.

Regional Meeting of College of Physicians.—A regional meeting of the American College of Physicians will be held at the Congress Hotel, Chicago, November 16 for the states of Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota and Wisconsin. In addition to the many speakers on the program offering scientific papers, an evening session will be presented with:

Dr. Morris Fishbein, Editor of THE JOURNAL, Chicago.
Mr. Edward R. Loveland, Philadelphia, executive secretary, American College of Physicians.
Dr. Ernest E. Irons, Chicago, past president and regent of the American College of Physicians.
Dr. David P. Barr, New York, professor of medicine, Cornell University Medical College; president, American College of Physicians.
Dr. LeRoy H. Sloan, Chicago, regent and general chairman of 1947 annual convention, American College of Physicians.
Dr. Chauncey W. Dowden, Louisville, Ky., chairman, Board of Governors and governor for Kentucky.
Dr. Andrew C. Ivy, Chicago, vice president and distinguished professor of physiology, University of Illinois College of Medicine.

New Foundation Awards Fellowships.—The Rosenstock Memorial Foundation, founded in February 1946, is offering three fellowships at $2,000 a year renewable on application and approval for an additional year. Since only three grants are available for the first year, the grants are limited to the support of medical research to be conducted in hospitals with medical school affiliations in any of the five boroughs in New York City. Fellowships may be granted either for full time or for part time medical research. Fellowships will be limited to those who will apply within three years of the completion of internship or residency, excluding time spent in military service. Applications must be endorsed by the director of the hospital where it is proposed that the research shall be conducted and forwarded by the endorser to the foundation at 42-16 West Street, Long Island City 1, N. Y., by November 1. Announcements of grants will be made in December and funds will then be turned over to the hospitals involved. The foundation was established by Mrs. Sadie S. Rosenstock, New York, as a memorial to her husband and daughter, Edgar and Marion Rosenstock. Members of the medical committee are Drs. Martin G. Vorhaus, chairman, James B. Amberson Jr. and Ephraim M. Bluestone, all of New York.

Group Formed to Combat Multiple Sclerosis.—The Association for Advancement of Research on Multiple Sclerosis has been organized, it was announced October 3. It is located in the New York Academy of Medicine Building, Fifth Avenue and 103d Street, New York, and was initiated by a group of multiple sclerosis patients together with friends and relatives in cooperation with some of the country's leading neurologists The objectives of the new organization are to:

Coordinate research efforts on multiple sclerosis in this country and abroad.
Gather statistics on its prevalence and geographic distribution.
Act as a clearing house for information on this disease.
Educate the public on the problem of multiple sclerosis.
Collect funds to stimulate and support research on multiple sclerosis and allied diseases.

It is planned to conduct a nationwide membership drive. The organization consists of a board of sponsors and a medical advisory board. Dr. Tracy J. Putnam, New York, is the honorary chairman. Members of the medical advisory board include:

Dr. Leo Alexander, Boston State and Beth Israel hospitals, Boston.
Dr. Bernard J. Alpers, Jefferson and Pennsylvania hospitals, Philadelphia.
Dr. Edward M. Bernecker, commissioner of hospitals, New York.
Dr. Richard M. Brickner, Neurological Institute, medical center, Mount Sinai Hospital, New York.
Dr. George G. Deaver, medical director, Institute for the Crippled and Disabled, New York.
Dr. Armando Ferraro, New York State Psychiatric Institute and Hospital, New York.
Dr. James C. Fox Jr., Hartford General Hospital, Hartford, Conn.
Dr. Orthello R. Langworthy, Johns Hopkins Hospital, Baltimore.
Dr. Roger I. Lee, Council on Medical Service, American Medical Association, Boston.
Dr. Roland P. Mackay, St. Luke's Hospital, Chicago.
Dr. Thomas M. Rivers, director, Hospital of the Rockefeller Institute for Medical Research, New York.
Dr. Colin K. Russel, Montreal Neurological Institute, McGill University, Montreal, Canada.
Dr. Walter F. Schaller, Lane and Stanford hospitals, San Francisco.
Dr. Mark I. Scheinker, University of Cincinnati, Cincinnati General Hospital, Cincinnati.
Dr. Francis F. Schwentker, Johns Hopkins Hospital, Baltimore.
Dr. Ernest L. Stebbins, dean of School of Hygiene, Johns Hopkins University, Baltimore.
Dr. Gabriel Steiner, Wayne University College of Medicine, Detroit.
Dr. Israel Weinstein, commissioner of health, New York.
Dr. Harold G. Wolff, New York Hospital, New York.
Dr. Henry W. F. Woltman, Mayo Clinic, Rochester, Minn.

CORRECTION

Liver Function Test.—In the Query and Minor Note entitled "Technic for Hippuric Acid Test for Liver Function," published in THE JOURNAL, September 14, page 117, the statement is made that the urine is treated with ammonium sulfate 95 Gm. to each 10 cc. The amount of ammonium sulfate should have been 5 Gm. rather than 95.

Deaths

Thomas Edward Carmody ✠ Denver; Denver and Gross College of Medicine, 1903; also a graduate in dentistry; born in Owosso, Mich., May 22, 1875; member of the House of Delegates 1927-1928 and chairman of the Section on Laryngology, Otology and Rhinology of the American Medical Association, 1930-1931; member, past president and member of the honorary society of the American Academy of Ophthalmology and Otolaryngology; member and past president of the American Bronchoscopic Society, American Laryngological Association, American Broncho-Esophagological Association and the American Laryngological, Rhinological and Otological Society; member of the American Society of Oral and Plastic Surgery and American Otological Society; fellow of the International College of Surgeons, the American College of Surgeons and the American College of Dentists; specialist certified by the American Board of Otolaryngology and the American Board of Plastic Surgery; for many years professor of bacteriology and histology and professor of oral surgery and rhinology at the University of Denver Dental School; formerly assistant in laryngology and otology at the University of Colorado School of Medicine, where he was chief of otolaryngology, child research council, research department, from 1928 to 1936; oral surgeon, Children's Hospital; otorhinolaryngologist, St. Luke's and Mercy hospitals; consulting otorhinolaryngologist, Sanatorium of the Jewish Consumptives' Relief Society in Spivak; served as first lieutenant in the medical reserve corps of the U. S. Army in 1917 and major in the medical corps of the U. S. Army, 1918-1919; author of a chapter in Jackson and Coates's book the Nose, Throat and Ear and Their Diseases; found dead aboard a Braniff air liner on its arrival at the municipal airport in Pueblo August 27, aged 71, of coronary occlusion.

Quincy Brown Lee ✠ Wichita Falls, Texas; University of Texas School of Medicine, Galveston, 1910; born in Peaster, Texas, March 18, 1888; past president of the Texas Surgical Society and the Wichita County Medical Society; member of the founders group of the American Board of Surgery; fellow of the American College of Surgeons; chairman of a committee for procurement and assignment of physicians in Wichita County during World War II; served during World War I; one of the organizers and for many years chief surgeon of the Wichita Falls Clinic-Hospital; past president of the Wichita Falls Rotary Club; died in St. John's Hospital, Jackson, Wyo., August 13, aged 58, of myocardial infarct.

Richard Joseph Tivnen ✠ Chicago; Rush Medical College, Chicago, 1895; for many years clinical professor of ophthalmology at the Loyola University School of Medicine; formerly instructor of ophthalmology at Northwestern University Medical School; member of the American Academy of Ophthalmology and Otolaryngology and the American Association of Railway Surgeons; fellow of the American College of Surgeons; past president of the Chicago Ophthalmological Society; received honorary doctor of laws degrees from Loyola and Notre Dame universities; affiliated with the Illinois Central Railroad and the Mercy Hospital, where he died August 27, aged 71, of coronary thrombosis.

T. Maurice Ahlquist ✠ Spokane, Wash.; Gross Medical College, Denver, 1898; fellow of the American College of Surgeons; on the staff of St. Luke's Hospital; received certificates of commendation from President Truman for his work on the Selective Service Board; died July 3, aged 69, of cerebral hemorrhage.

David Darwin Alsbacher, Cleveland; University of Wooster Medical Department, Cleveland, 1904; died in the Cleveland Clinic Hospital July 30, aged 64, of aplastic anemia.

William Andrew Balcke ✠ Pekin, Ill.; St. Louis College of Physicians and Surgeons, 1898; served during World War I; on the staff of the Pekin Public Hospital; died August 14, aged 70, of coronary thrombosis.

Soddie James Barkett, Bloomington, Ill.; University of Illinois College of Medicine, Chicago, 1940; interned at the Charity Hospital in New Orleans and served a residency at the Baptist Hospitals (West End and Highland Avenue Branches) Birmingham, Ala.; served during World War II; found dead in his room at the Y. M. C. A. in Chicago, August 20, aged 32.

Luther Leslie Barnes, Sweetwater, Tenn.; University of Nashville Medical Department, 1908; member of the American Medical Association; died in the Sweetwater Hospital August 28, aged 65, of hypertensive cardiovascular heart disease and diabetes mellitus.

John K. Blackstone, Crown Point, Ind.; University of Louisville (Ky.) Medical Department, 1885; served on the board of health and as surgeon for the Pennsylvania and Erie railroads; died August 12, aged 84, of chronic myocarditis.

Emil William Brust, Addison, Ill.; Baltimore University School of Medicine, 1898; on the staff of the Westlake Hospital, Melrose Park and the Elmhurst (Ill.) Community Hospital; died August 27, aged 70, of coronary thrombosis.

Allen Grover Caldwell ✠ Covington, Ky.; University of Louisville Medical Department, 1914; served during World War I; on the staff of the Booth Memorial Hospital; died while on a train en route to New York August 30, aged 58, of coronary thrombosis.

Antonio D'Amico, Newark, N. J.; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1897; died in Hackensack, July 6, aged 75, of cerebral thrombosis.

Robert Charles Davis ✠ Johnstown, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1908; fellow of the American College of Surgeons; past president of the Cambria County Medical Society; served on the staff of the Conemaugh Valley Memorial Hospital; surgeon for the Bethlehem Steel Company and Baltimore and Ohio Railroad; died August 15, aged 66, of coronary occlusion.

Albert Barker Devers, Cincinnati; Miami Medical College, Cincinnati, 1896; on the staffs of the Jewish and Bethesda hospitals; died August 5, aged 78, of coronary occlusion.

Frederick Joseph Djerf, Fitchburg, Mass.; Tufts College Medical School, Boston, 1929; member of the American Medical Association and the New England Obstetrical and Gynecological Society; fellow of the American College of Surgeons; visiting surgeon to the Burbank Hospital; died July 15, aged 44.

Charles Herbert Doe ✠ Tacoma, Wash.; University of Pennsylvania School of Medicine, Philadelphia, 1912; member of the Association of Resident and Ex-Resident Physicians of the Mayo Clinic; served during World War I; died suddenly, August 11, aged 55, of coronary occlusion.

Paul Chadbourne Eschweiler ✠ Little Rock, Ark.; University of Wisconsin Medical School, Madison, 1928; professor of medicine at the University of Arkansas School of Medicine; fellow of the American College of Physicians; was recently shot and killed, aged 43.

Joseph Paul Fakehany ✠ Toledo, Ohio; Loyola University School of Medicine, Chicago, 1939; interned at the Lucas County General Hospital; served a residency at the Mercy Hospital; died August 17, aged 33, of internal injuries received when the automobile in which he was driving was struck by a train.

Louis Faulkner ✠ Chicago; Chicago Homeopathic Medical College, 1896; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1904; on the staff of the West Suburban Hospital in Oak Park, Ill., where he died August 6, aged 72, of pneumonia.

Henry Finkelpearl, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1894; also a graduate in pharmacy; staff member and founder of the old Montefiore Hospital and instrumental in building the new Montefiore Hospital; died August 17, aged 79, of coronary thrombosis.

Robert Gordon Fowler, Cherry Creek, N. Y.; University of Buffalo School of Medicine, 1913; served during World War I; health officer; on the staff of the Woman's Christian Association Hospital, Jamestown, where he died August 15, aged 59, of hypostatic pneumonia.

August Molkel Fromm, Ramsey, Ill.; Bennett Medical College, Chicago, 1914; a member of the American Medical Association; past president of the Fayette County Medical Society; served as mayor of Ramsey and on the school board for many years; died August 23, aged 60, of carcinoma.

Maud Josephine Frye ✠ Buffalo; University of Buffalo School of Medicine, 1892; died August 26, aged 79, of carcinoma.

Harry S. Funk, Port Murray, N. J.; Jefferson Medical College of Philadelphia, 1878; died June 12, aged 90, of arteriosclerotic heart disease.

John Waldo Funk ✠ Murrysville, Pa.; Western Reserve University Medical Department, Cleveland, 1911; past president of the school board and board of health of Forest Hills; secretary of the draft board for World War I; surgeon for Union Railroad (U. S. Steel); formerly on the staff of the Braddock (Pa.) General Hospital; died August 11, aged 62, of coronary thrombosis.

Ralph Francis Gregorius ✠ South Orange, N. J.; Ohio State University College of Medicine, Columbus, 1914; served during World War I; on the staff of the Orange (N. J.) Memorial Hospital; died July 31, aged 54, of lymphosarcoma of the spleen.

Joseph Moffett Hall, Minneapolis; University of Minnesota Medical School, Minneapolis, 1913; an affiliate member of the Minnesota State Medical Association; member of the American Medical Association; on the staff of the Asbury Hospital; died July 19, aged 58, of cardiac decompensation.

Oliver Doyle Hall ✠ Decatur, Ga.; Atlanta College of Physicians and Surgeons, 1906; on the staff of the Georgia Baptist Hospital, Atlanta, where he died August 13, aged 68, of coronary thrombosis.

Harold Joseph Halligan ✠ Jersey City, N. J.; Long Island College Hospital, Brooklyn, 1926; fellow of the American College of Surgeons; member of the city board of health; associate obstetrician to the Margaret Hague Hospital; visiting surgeon to the Jersey City Medical Center and St. Francis Hospital, where he died August 23, aged 44, of gastric hemorrhage.

Raymond Alexis Harpin, Lynn, Mass.; Boston University School of Medicine, 1931; member of the American Medical Association; fellow of the American College of Surgeons; served as assistant in genitourinary surgery at his alma mater; for many years on the staff of the Lynn Hospital; died August 10, aged 42, of coronary thrombosis.

Louis Goldberg Heyn ✠ Cincinnati; Medical College of Ohio, Cincinnati, 1902; specialist certified by the American Board of Internal Medicine; associate professor of medicine at the University of Cincinnati College of Medicine; president of the medical staff of the Jewish Hospital; died in Petoskey, Mich., August 21, aged 68, of myocardial infarction.

George Matthew Hieber, Richmond Hill, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1906; member of the American Medical Association; on the courtesy staff of the Jamaica (N. Y.) Hospital; died August 18, aged 68, of multiple ulcerations of the colon.

Arthur C. Horton, Brownsboro, Texas (licensed in Texas, under the Act of 1907); vice president of the Henderson County Medical Society, of which he had been president; member of the American Medical Association; city health officer; died in Jacksonville June 5, aged 72, of leukemia.

Hector Smythe Howard, Jackson, Miss.; University of Tennessee College of Medicine, Memphis, 1925; died August 14, aged 48.

Max Samuel Kaplan ✠ Canton, Ohio; University of Pennsylvania School of Medicine, Philadelphia, 1925; accidentally drowned July 20, aged 46, when his boat capsized while he was fishing at Seneca Lake near Senecaville.

Seth Wessner Kistler, Nanticoke, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1901; member of the American Medical Association; medical consultant, Nanticoke State Hospital; a founder and honorary member of the staff of the Wyoming Valley Homeopathic Hospital in Wilkes-Barre; vice president and director of the Nanticoke National Bank; died August 9, aged 72, of cerebral hemorrhage.

DeWitt Talmage Langston, Newhebron, Miss.; Medical Department of Tulane University of Louisiana, New Orleans, 1910; died August 24, aged 61, of heart disease.

John Hancock Lawrence, Sioux City, Iowa; University of Michigan Homeopathic Medical School, Ann Arbor, 1888; died June 25, aged 82, of coronary disease.

Arthur A. Libby ✠ Pasadena, Calif.; University of Southern College of Medicine, Los Angeles, 1897; died July 23, aged 81.

Maybelle Maud Park, Seattle; Woman's Medical College of Pennsylvania, Philadelphia, 1894; member of the American Medical Association; retired in 1943 as assistant medical director of the city public schools; died in Milwaukee, July 5, aged 75, of rheumatic heart disease.

Joseph B. Parker, Sikes, La.; Memphis (Tenn.) Hospital Medical College, 1903; died July 18, aged 71, of heart disease.

George Rue Pennington, St. Louis; St. Louis University School of Medicine, 1902; died in the Park Lane Hospital August 18, aged 78, of acute appendicitis.

Francis Dickerson Purnell ✠ Philadelphia; Temple University School of Medicine, Philadelphia, 1932; diplomate of the National Board of Medical Examiners; examining physician for the local draft board; on the staffs of the Mercy Hospital and the Henry Phipps Institute; died August 3, aged 45, of congestive heart failure.

Sampson D. Queener, Jacksboro, Tenn.; Tennessee Medical College, Knoxville, 1904; member of the American Medical Association; an examining physician for Campbell County draft boards during World Wars I and II; for many years county physician; formerly member of the school board; director of the First State Bank; surgeon for the Louisville and Nashville Railroad; died July 10, aged 72, of cancer of the kidney.

John Raftery ✠ Philadelphia; Temple University School of Medicine, Philadelphia, 1910; served as vice president of the Philadelphia County Medical Society and formerly president of the Northeast Branch; on the staffs of the Frankford Hospital, St. Mary's Hospital and the Nazareth Hospital, where he died August 7, aged 64, of cerebral thrombosis.

Charles Reichert Reider, St. Louis; Barnes Medical College, St. Louis, 1907; also a graduate of a school of law; died August 12, aged 64, of angina pectoris.

Isidore Eugene Reid ✠ Boston; University of Edinburgh Faculty of Medicine, Scotland, 1897; served on the staffs of the Mount Sinai and Faulkner hospitals; died in Cleveland August 12, aged 72.

Edwin Bruce Rhea ✠ Showns, Tenn.; Jefferson Medical College of Philadelphia, 1913; served during World War I; died in August, aged 63, of angina pectoris.

Jane Elizabeth Robbins, Wethersfield, Conn.; Woman's Medical College of the New York Infirmary for Women and Children, 1890; died in Hartford August 16, aged 85, of senility.

George Hope Ryder ✠ New York; Columbia University College of Physicians and Surgeons, New York, 1899; served as clinical professor of obstetrics at his alma mater; specialist certified by the American Board of Obstetrics and Gynecology; fellow of the American College of Surgeons; for many years affiliated with Sloane Hospital, Fifth Avenue and Doctors hospitals; died in Babylon, Long Island, August 27, aged 73, of coronary thrombosis.

Horace Graham Savage, Warsaw, Mo.; Louisville (Ky.) Medical College, 1893; Bellevue Hospital Medical College, New York, 1895; member of the American Medical Association; served during World War I and as mayor; died August 15, aged 78, of myelogenous leukemia.

William Douglas Sayre, Red Bank, N. J.; Jefferson Medical College of Philadelphia, 1908; member of the American Medical Association; served during World War I; until recently a medical inspector in the Red Bank school system; on the staff of the Riverview Hospital; died August 20, aged 59, of coronary thrombosis.

George Lee Servoss, Reno, Nev.; Medical College of Indiana, Indianapolis, 1894; member of the American Medical Association; secretary of the Washoe County Medical Society; died August 7, aged 79, of carcinoma of the stomach.

Ira Ernest Shaffer, Rhinebeck, N. Y.; Albany Medical College, 1892; died July 29, aged 76.

Frederick Leo SinClair, Oswego, N. Y.; Eclectic Medical College of the City of New York, 1896; member of the American Medical Association; honorary member of the Oswego Academy of Medicine; honorary member of the medical staff of the Oswego Hospital, where he died June 18, aged 75, of acute cholecystitis and pneumonia.

James Edwin Smith, Petersburg, Va.; University College of Medicine, Richmond, 1900; member of the American Medical Association; on the staff of the Central State Hospital; died August 15, aged 72, of chronic myocarditis.

Glenn Taylor Soule, Henderson, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1911; member of the American Medical Association; served during World War I; on the staff of the Memorial Hospital, Owosso, where he died July 20, aged 59, of cerebral hemorrhage.

John Samuel Tucker, Dixiana, Ala.; Medical College of Alabama, Mobile, 1906; member of the American Medical Association; died in the Norwood Hospital, Birmingham, July 28, aged 65, of subphrenic abscess as a result of gangrenous gallbladder.

Norman Grant Tufford, Detroit; University of Toronto Faculty of Medicine, 1923; member of the American Medical Association, American Psychoanalytic Association, American Psychiatric Association and American Psychopathological Association; died August 10 in Eskilstuna, Sweden, aged 50, of coronary disease.

John Weir, West Union, Ill.; Kentucky School of Medicine, Louisville, 1892; Rush Medical College, Chicago, 1896; served as school director and mayor of Marshall, Ill.; member of the public library board; died July 19, aged 78, of coronary occlusion.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 22, 1946.

The Calciferol Treatment of Lupus Vulgaris

In 1943 a dermatologist, Dr. G. B. Dowling, began to treat lupus vulgaris with large doses of calciferol (vitamin D_2) with excellent results. The maximum dose was 150,000 international units daily, which is the highest dose that most patients appear to be able to take without feeling sick. After varying periods the dose was reduced to 100,000 and 50,000 units daily. On the dosage prescribed few patients showed any sign of intolerance, and those that did were able to take the lower dose without discomfort. The cases were almost all old ones and many had received local treatment, chiefly with the Finsen or the Kromayer light and acid mercurous nitrate. The oldest cases were scarred by x-ray treatment. Under calciferol the great majority of the cases regressed remarkably, sometimes to the point of disappearance. Subsequently Dowling became aware that the calciferol treatment had been introduced in 1941 in France by M. J. Charpy with even better results. Charpy claims that since that year lupus vulgaris has almost completely disappeared from France. His method is to give 15 mg. of calciferol (600,000 international units) in alcoholic solution by mouth weekly for three months, then fortnightly for the next three months and after that monthly during the winter months.

Dowling's first patient, a man aged 28, had confluent lupus of the face and ears. The disease began at 20 near the right ear and steadily spread over the nose and cheeks. For nine months the whole face had been edematous. During the previous five years he had carbon arc light baths and Finsen applications. Calciferol 50,000 units thrice daily was given. After a few days he developed nausea and had to go to bed. The skin became worse, congestion increased and there was some exudation. He therefore discontinued the treatment. But after a fortnight the lupus had so improved that he resumed the treatment. After a month the congestion returned but less severely. He again discontinued it temporarily. After that he tolerated the drug, and the dose was reduced to 50,000 units twice daily. Two years after beginning the treatment there were no signs of activity except two doubtful nodules on the right cheek. The dose was further reduced to 50,000 units daily and then stopped.

Calciferol has been used in a variety of diseases, and toxic symptoms—anorexia, nausea, vomiting, diarrhea and polyuria—are not infrequent. Excessive doses may produce calcification of the soft tissues, particularly of the renal tubules and blood vessels. It has been held that symptoms are a better guide as to overdosage than estimation of the blood calcium.

More Blood Transfusion Than in Wartime

The Blood Transfusion Service established to deal with the injuries of war has been continued, for the use of blood transfusion in the treatment of disease has so increased that it is performed more frequently than it was during the war. Opening new premises for the Blood Transfusion Service at Liverpool, the parliamentary secretary to the Ministry of Health stated that transfusion is now an essential part of our health service. "This generation is inheriting," he said, "the benefits of new treatment developed intensively during the war." Advances have also been made in the production of blood products. For instance, a special foam is made from blood plasma for the control of hemorrhage in various operations where tying of blood vessels is not advisable. This is of great value in brain and spinal surgery.

A. Tudor Edwards is Dead

Mr. A. Tudor Edwards, a pioneer in thoracic surgery with an international reputation, has died suddenly at the age of 56. His appointment to the Brompton Hospital for Diseases of the Chest after the war of 1914-1918 gave him the opportunity for showing where his genius lay. The work of Delbet, Gask and others had shown that surgery had an important place in the treatment of thoracic injuries and pointed the way to further developments in the treatment of thoracic diseases. When Tudor Edwards joined the staff of the Brompton Hospital the surgery of the thorax scarcely existed in England except for an occasional thoracoplasty or operation for empyema. By his pioneer work Edwards advanced thoracic surgery from an occasional and precarious intervention to an acknowledged specialty ranking with abdominal and other recognized branches. He was the first surgeon in this country to perform with success lobectomy by dissection, and he had many successes with tourniquet lobectomy before its general introduction in 1931. He was also the first surgeon in this country to perform pneumonectomy and was among the first to perform successful resection of the carcinomatous esophagus. The extent of his vast operative experience is shown by a paper in the first issue of *Thorax*, which contains an analysis of more than a thousand cases of bronchial carcinoma in which he performed pneumonectomy or lobectomy. In his Harveian lecture of 1939 he reported 199 cases of bronchiectasis treated by lobectomy and pneumonectomy. He trained many thoracic surgeons, and his operating theater was attended by surgeons from all over the world, sometimes by as many as a dozen from different countries. The surgery of pulmonary tuberculosis, bronchiectasis, tumors of the mediastinum and malignant and simple tumors of the lungs became in turn the subject of special investigation by him. He was adviser in thoracic surgery to the War Office and he organized all the centers for the reception of thoracic casualties during the war. When the London Hospital decided to institute a department of thoracic surgery he was asked to take charge of it. He was president of the Society of Thoracic Surgeons and honorary fellow of the American Society of Thoracic Surgeons.

CHILE

(From Our Regular Correspondent)

Aug. 1, 1946.

Meeting of Representatives of the Rockefeller Foundation

A meeting of the representatives of the Rockefeller Foundation in Latin American countries was held in Santiago de Chile, July 1-6. It was organized by Dr. L. W. Hackett of Buenos Aires, representative of the foundation for the Andes region and for La Plata Province. At the meeting were Drs. A. J. Warren of New York, L. W. Hackett and G. W. Wells of Buenos Aires, representatives of Argentina; G. Hayes of Rio de Janeiro, representative of Brazil; J. L. Hydrick, O. L. Peterson and B. E. Sasse of Lima, representatives of Peru; G. W. Bevier of La Paz, representative of Bolivia; Miss Esther M. Hirst, Washington, D. C., head of the American Group of Nurses, and Dr. J. H. Janney of Santiago, representative of Chile.

The program included visits to the Escuela de Salubridad, Escuela de Enfermeria de los Servicios de Beneficencia y Asistencia Social, Unidad Sanitaria Quinta Normal, Control de Tuberculosis, Control de Alimentos, Control de Tifus Exantematico y Desinsectizacion and Hospitales Trudeau y de Enfermedades Infecciosas.

The Escuela de Salubridad (School for Studies on Public Health and Sanitation), which was established in 1943, is supported by cooperation of the University of Chile, the National Department of Public Health, the Bacteriologic Institute of

Chile and the Rockefeller Foundation. Its advisory committee comprises the dean of the Faculty of Biology and Medical Sciences (the chairman), the representatives of the aforementioned centers and Dr. Herman Romero, director of the School of Medicine of the Faculty. Besides the regular courses in the Faculty of Medicine there are various postgraduate courses, Rockefeller Foundation scholarships and courses in the specialties in the United States for Latin American physicians enrolled in the school. The aim is to prepare physicians specializing in this field for the various problems on public health and sanitation. There are also extraordinary courses for physicians working in centers of public health, public assistance, laboratory work, medical inspectors of food and physicians working in correlated fields.

The School of Nurses for study in the field of social work is supported by the Faculty of Biology and Medical Sciences, is supervised by the dean of the faculty and is directed by Miss Eugenia Caete and a group of graduate nurses. Teaching is carried on in the school, and the practice of nursing is carried on in the hospitals. The studies are in accordance with international requirements, which include an M.S. diploma for admission to the school, three years of studies and three years of internship.

The Normal Fifth Sanitary Unit was established in 1946 through the collaboration of the National Service of Public Health and the Rockefeller Foundation. Medical and hygienic care are administered through this union to more than 80,000 persons in rural or city zones if they are of moderate means. The unity establishes special contracts for giving care to persons in the groups of the Caja de Seguro Obrero Obligatorio and the local branch of the General Department of Protection to Infants and Adolescents. It has various departments for the care of mothers and their infants and control of venereal diseases and of infection and health education of the people. The personnel on full time consists of Dr. Herman Urzuo, the head of the unit, a large number of nurses specializing in hygiene and public health, and a group of dietitians under the guidance of Dr. Julio Santa Maria, the visiting members of which give demonstrations and lessons on nutritional problems to families in their homes.

The Center for the Control of Tuberculosis works in connection with the Normal Fifth Sanitary Unit on the premises of the unit. Supported by the Rockefeller Foundation, it is formed by a group of specialized physicians with Dr. E. Pereda head of the department. Its functions are the health education of the people, medical care to ambulatory patients, collapse therapy, investigation of contacts and data on epidemiology.

The Department for the Control of Food is supported by the Chile branch of the Institute of Inter-American Affairs, the headquarters of which are in Washington, D. C. Dr. Victor Arancibia, who did postgraduate work in this subject in the United States, is the head of the department. The functions of the department are the inspection of health conditions of places in which food is prepared or sold to guarantee requirements concerning cleanliness and proper disinfection of utensils, examination of samples for quality and purity of food and requirements of proper hygiene of the employees. The inspectors are trained by the School of Sanitation.

The Department for the Control of Exanthematic Typhus and Disinfection is an independent department supported by the branch on public health of the Institute of Inter-American Affairs. There is a chronic focus of exanthematic typhus in the city of Santiago and in some provincial districts. The National Department of Public Health established a long time ago several centers for the poor with baths and rooms for the disinfection of clothing. New centers for disinfection have been established. Dr. Victor Ayub is the head of the department for the control and prevention of typhus. The department has several branches distributed over the country, with specialized personnel under the direction of Dr. Ayub. The functions of the department include immunization with the Cox vaccine, disinfection with DDT, detection of cases, hospitalization of patients, isolation and disinfection of infected houses, detection of contacts, experimental epidemiologic studies, crusades against rodents, insects and flies, and education of the people in sanitation.

Brief Items

Drs. A. J. Warren, New York, L. W. Hackett, Buenos Aires, and J. H. Janney, Santiago, Chile, all representatives of the Rockefeller Foundation, were recently appointed honorary members of the Faculty of Medicine of the Chile University at a special meeting of the faculty.

Dr. Alfonso Constant of Santiago, Chile, the head of the department of surgery at the San Francisco de Borja Hospital of Santiago, was recently appointed professor of surgery at the Faculty of Medicine of the Santiago University.

Dr. Alejandro Olivares, Santiago, was recently appointed president of the Sociedad Médica of Santiago.

Dr. Howard W. Florey of the University of Oxford, England, recently visited Chile in response to cordial invitations of the Chilean medical profession. In Santiago he remained one week. He gave four interesting lectures on penicillin in the Chilean universities. Dr. Florey is an honorary member of the University of Chile. The Chilean government conferred on him the Al Mérito medal, which was established in 1818 and is the only Chilean medal.

The Trudeau Hospital and the A. Horwitz Hospital for infections now under construction will be opened to the public in the near future.

Recent Deaths

Dr. Joaquin Luco, professor of neurology at the Faculty of Medicine of the University of Chile.

Dr. Emilio Aldunate, a professor of clinical medicine at the Faculty of Medicine of the University of Chile.

Dr. Luis Vargas Salcedo, a professor of surgery at the Faculty of Medicine of the University of Chile.

BRAZIL

(From Our Regular Correspondent)

RIO DE JANEIRO, Sept. 7, 1946.

Tyrothricin in the Treatment of South American Paracoccidioidomycosis

Drs. Carlos S. Lacaz, Moacyr S. Silva and Moacyr Fernandes, from the department of microbiology of the University of São Paulo, have published a report of the results of their investigation on the action of tyrothricin in the treatment of South American paracoccidioidomycosis (blastomycosis). In vitro experiments demonstrated that tyrothricin has a fungicidal effect on Paracoccidioides during the latent stage of growth but only a fungistatic effect if actual growth of the organism has begun. In spite of this effective in vitro action its use is limited in the treatment of paracoccidioidic granulomatosis, since the drug can be applied only directly to the lesions, owing to toxic and hemolytic properties. In several cases treated by the authors, tyrothricin proved to be of value as an adjuvant to sulfadiazine and polyvalent antimycotic vaccine.

Personal

The National Academy of Medicine has conferred the Souza Araujo Prize on Dr. J. Paulo Vieira for his monograph on pemphigus foliaceus ("wild fire"). Dr. Vieira is the director of the special service of pemphigus foliaceus of the São Paulo State Department of Health.

Correspondence

LEPROSY

To the Editor:—In an article on leprosy in THE JOURNAL, Oct. 23, 1943, page 466, Dr. Chester N. Frazier lamented that less is known of the essential factors in the pathogenesis and transmission of leprosy than of the other great infectious diseases of mankind and questioned the position of Mycobacterium leprae as the cause of the disease.

On Oct. 11, 1945 I was honored by a long visit from your Past President Dr. James E. Paullin (1943-1944) accompanied by Captain Craig of the U. S. Navy and Mayo Clinic, with a note of introduction from Lieut. Comdr. Herbert Alden (navy dermatologist, now practicing in Atlanta, Ga.). Commander Alden spent many days at the San Lazaro Hospital making clinical, pathologic and bacteriologic observations on lesions of contact children of leprous patients, of whom we have in segregation about 130 of both sexes and from 7 to 30 years of age. Dr. Alden, including others with his specialty and the medical officers of the Army, Navy and U. S. Public Health Service, were unanimous in their statement that early lesions of leprosy shown to them and proved to be so, after years of pathologic and bacteriologic follow-up, were either new to them or would have been diagnosed as lupus erythematosus, tuberculosis, syphilis or Boeck's sarcoid if seen in United States clinics.

When I started to study the pathogenesis of leprosy on contact children of leprous patients in 1931 I was in exactly the same predicament as Frazier, but in interpreting my findings I was forced to abandon the prevailing concepts on its etiology and transmission after a consideration of epidemiologic and human inoculation evidences and concluded that (1) the cause of leprosy is a submicroscopic or "virus" stage of M. leprae; the bacillus is inactive, a late microscopic symptom; (2) the disease is contracted in infancy and early childhood up to 4 years by frequent and prolonged skin to skin contact while being carried by a leprous patient; (3) that both bacteria negative and positive leprous patients are transmitters of the disease, and (4) that the disease is not curable.

Should these concepts receive confirmation, they will surely pave the way to humanizing the treatment of patients with leprosy because in its prevention attention would be centered on isolating the susceptible infant which might have to be handled by the diseased, allowing the child to pursue a normal productive life if capable or be treated as an ordinary patient.

My pathologic findings on which the new concepts are based have since 1932 been confirmed by Wade and others in the Philippines, Ota and Sato in Japan, Lowe in India, Ermakowa in Russia and Schujman in Argentina, but, as is to be expected, most of them did not agree with some of my interpretations. Half a dozen of your top brains in bacteriology and epidemiology (Gay, Soule, McKinley, Saunders, Hanks and Doull) have been engaged by the Leonard Wood Memorial (American Leprosy Foundation) since 1932 for an intensive study on the transmission of leprosy; many articles have already been published, and accumulated epidemiologic material is still being worked out at Western Reserve University, Cleveland; but the hope of revealing the truth about it is still a big question. The reason is obvious: your experts cannot simply afford to stay indefinitely in the Philippines. Neither would it be practicable, though ideal, to transport some of our contact children to America and place them under scientific observation during most of their entire life.

It is not my intention to belittle, much less criticize, the American Leprosy Foundation in its magnificent efforts, but in my work another line of attack, pathogenesis, and from it mode of transmission, suggested itself. Because, as Frazier put it, "there is lack of understanding of the natural history of leprosy" and that "to divide the disease into carefully defined categories, as for example nodular and anesthetic, is to miss the point of its evolution," will it not be possible to request the cooperation of the American Medical Association to stimulate the Section on Dermatology and Syphilology, whose membership includes leprosy workers, to plan a careful approach and get the cooperation of available children of persons with leprosy, especially the mothers, now isolated at Carville, and subject them to periodic (six months or yearly) dermatologic, neurologic, pathologic and bacteriologic examinations? In the case of isolated young leprous patients, the parents, especially the mother, may be induced to submit to an examination. Dermatologists, such as those practicing in Texas and Louisiana, might also be encouraged to follow up for many years their patients with Boeck's sarcoid, lupus erythematosus and similar dermatoses, and their living parents, particularly again the mothers, may be asked to cooperate and submit to examination. This follow-up observation need not require a new organization, because it takes comparatively little time and effort and, as I have indicated, could easily be just a small side study. But the accumulated information of many years will, I am sure, be a revelation of Frazier's natural history of leprosy.

I admit that the disease is rare in the United States, but I also recall that the dean of American leprologists, McCoy, concurred in by the late Hans Zinsser, once stated that, after all, the United States might be the best place to study the epidemiology of leprosy because its very rarity will facilitate tracing of the source of infection.

We in the Philippines still look up to America for cooperation in the solution of technical problems, and who knows but to the greatest medical organization of its kind in the world may yet belong the everlasting gratitude of a humanized leprous world?

CRISTOBAL MANALANG, M.D.,
San Lazaro Hospital,
Manila, P. I.

Medical Motion Pictures

FILM REVIEW

Intravenous Anesthesia. By Major L. H. Mousel, M. C., A. U. S., and Major E. B. Touhy, M. C., A. U. S. Color, silent, 1,018 feet (3 reels), showing time forty-two minutes. Produced by Mervin W. La Rue at Walter Reed Hospital, Washington, D. C., and the Percy Jones General Hospital, Battle Creek, Michigan in 1945-46. By authority of the Surgeon General, U. S. Army. Procurable from Abbott Laboratories, North Chicago, Ill.

The authors present a teaching film which apparently was prepared to illustrate the simplest technic for the cautious clinical administration of intravenous sodium pentothal. The photography is excellent and presents in detail the correct preparation and administration of the drug as well as the careful and most important management of the patient during anesthesia. Considerable footage is allotted to various surgical procedures being performed under intravenous anesthesia.

The addition of more text, including the treatment of overdosage, would be a valuable adjunct to this film. Even in the hands of the most expert, an idiosyncrasy or overdosage may be encountered, thus making inclusion of this factor very important in a teaching film.

Two typographical errors in the text need correcting. Since the main use of intravenous anesthesia is now in the well equipped civilian hospital, it is suggested that the addition to the text of the proved value of combining the inhalation of 50-50 nitrous oxide-oxygen with intravenous pentothal should be stressed. A brief statement as to the time required postoperatively for the patient to be mentally clear and responsible should be included, if disasters are to be avoided during this period.

This film is recommended for the teaching of medical students, anesthesiology residents and any physicians who need instruction in the proper administration of intravenous pentothal anesthesia.

Medical Examinations and Licensure

COMING EXAMINATIONS AND MEETINGS

NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and the Examining Board in Specialties were published in THE JOURNAL, October 12, page 349.

BOARDS OF MEDICAL EXAMINERS

ALABAMA: *Examination.* Montgomery, Jan. 21-23. Secretary, State Board of Medical Examiners, B. F. Austin, M.D., 519 Dexter Ave., Montgomery.

ARKANSAS:* Little Rock, Nov. 7-8. Sec., Medical Board of the Arkansas Medical Society, Dr. L. J. Kosminsky, Texarkana. *Eclectic.* Little Rock, Nov. 7. Sec., Dr. C. H. Young, 1415 Main St., Little Rock.

CALIFORNIA: *Examination.* Sacramento, Oct. 21-24. Secretary, Board of Medical Examiners, Dr. Frederick N. Scatena, 1020 N. Street, Sacramento.

CONNECTICUT:* *Examination.* Hartford, Nov. 12-13. Sec., Dr. Creighton Barker, 258 Church St., New Haven. *Homeopathic.* Derby, Nov. 12-13. Sec., Dr. J. H. Evans, 1488 Chapel St., New Haven.

DELAWARE: *Examination.* Dover, Jan. 14-16. *Endorsement.* Dover, Jan. 21. Sec., Medical Council of Delaware, Dr. J. S. McDaniel, 229 S. State St., Dover.

FLORIDA:* *Examination.* Jacksonville, Nov. 26-27. Sec., Dr. Harold D. Van Schaick, 2736 S.W. 7th Ave., Miami 36.

HAWAII: *Examination.* Honolulu, Jan. 13-16. Secretary, Board of Medical Examiners, Dr. S. E. Doolittle, 881 S. Hotel St., Honolulu.

IDAHO: *Examination.* Boise, Jan. 14. Director, Board of Medical Examiners, Mrs. Agnes Barnhart, Room 355, State House, Boise.

INDIANA: *Examination.* Indianapolis, June. Exec. Secretary, Board of Medical Registration and Examination, Miss Ruth V. Kirk, 627 K. of P. Bldg., Indianapolis.

KANSAS: Kansas City, Dec. 4-5. Secretary, Board of Medical Registration and Examination, J. F. Hassig, M.D., 905 North 7th Street, Kansas City.

KENTUCKY: *Examination.* Louisville, Dec. 16-18. Sec., State Board of Health, Dr. P. E. Blackerby, 620 S. Third St., Louisville 2.

MAINE: Portland, Nov. 12-13. Sec., Board of Registration of Medicine, Dr. A. P. Leighton, 192 State St., Portland.

MARYLAND: *Examination.* Baltimore, Dec. 10-13. Sec., Dr. E. H. Kloman, 1215 Cathedral St., Baltimore 1. *Homeopathic.* Baltimore, Dec. 10-11. Sec., Dr. J. A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: *Examination.* Boston, Nov. 19-22. Sec., Board of Registration of Medicine, Dr. H. Q. Gallupe, 413-F State House, Boston 33.

MISSISSIPPI: *Reciprocity.* Jackson, Dec. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson 113.

MISSOURI: *Examination.* St. Louis, Oct. 28-30. Dir., Medical Licensure, State Board of Health, Mrs. Lucy Motley, State Capitol Bldg., Jefferson City.

NEBRASKA:* *Examination.* Omaha, June 1947. Director, Bureau of Examining Boards, Mr. Oscar F. Humble, State Capitol Building, Lincoln.

NEVADA: *Examination.* Carson City, Nov. 4. Secretary, Board of Medical Examiners, Dr. G. H. Ross, 215 N. Carson St., Carson City.

NORTH CAROLINA: *Examination.* Winston-Salem, Dec. 16-19 postponed. *Endorsement.* Raleigh, Jan. 16. Act. Sec., Mrs. L. McNeill, 226 Hillsboro St., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 7-10. Secretary, Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Examination.* Columbus, Dec. 3-5. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON:* *Examination.* Portland, Jan. *Reciprocity.* Portland, Oct. 26. Exec. Sec., Miss L. M. Conlee, 608 Failing Bldg., Portland 4.

PENNSYLVANIA: *Examination.* Harrisburg, Oct. Act. Sec., Bureau of Professional Licensing, Dept. of Public Instruction, Mrs. M. G. Steiner, 351 Education Bldg., Harrisburg.

SOUTH CAROLINA: Columbia, Nov. 11-12. Sec., Dr. N. B. Heyward, 1329 Blanding St., Columbia.

SOUTH DAKOTA:* *Examination and Reciprocity.* Vermillion, Jan. 21-22. Secretary, Board of Medical Examiners, Dr. Gilbert Cottam, State Capitol Building, Pierre.

TEXAS: *Examination.* Oct. 31-Nov. 2. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas 2.

VERMONT: *Examination.* Burlington, Jan. 31-Feb. 1. Secretary, Board of Medical Registration, Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, Dec. 3-6. Secretary, Board of Medical Examiners, Dr. J. W. Preston, 30½ Franklin Rd., Roanoke.

WASHINGTON: *Examination.* Seattle, Jan., 1947. Secretary, Mr. Nelson Vaughn, Olympia.

* Basic Science Certificate required.

BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Dec. 10. Sec., Mr. Francis A. Roy, Science Hall, University of Arizona, Tucson.

DISTRICT OF COLUMBIA: *Examination.* Washington, Oct. 21-22. Sec., Commission on Licensure, Dr. G. C. Rubland, 6150 E. Municipal Bldg., Washington.

FLORIDA: *Examination.* Gainesville, Nov. 2. Sec., Dr. J. F. Conn, John B. Stetson Univ., Deland.

NEW MEXICO: *Examination.* Nov. 3. Sec., Miss Marion M. Rhea, State Capitol, Santa Fe.

OREGON: *Examination.* Portland, Nov. 2. Sec., Mr. C. D. Byrne, Univ. of Oregon, Eugene.

RHODE ISLAND: *Examination.* Providence, Nov. 13. Chief, Mr. Thomas B. Casey, 366 State Office Bldg., Providence.

SOUTH DAKOTA: Sioux Falls, Dec. 6-7. Sec., Dr. G. M. Evans, Yankton.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: County Physicians as Employees.—The Industrial Commission of Arizona commenced an action against the county of Navajo to require it to report the salaries, wages, commissions or fees paid to contract county physicians. This was an original proceeding in the Supreme Court of Arizona.

The physicians in question are under contract to render necessary medical and surgical aid to indigent sick within the county. In the performance of their duties they are not supervised or controlled by the county in the ministration of medicine, treatment and surgery, the county supervisors being lay individuals who do not pretend to have any knowledge or skill in medicine or surgery. The physicians use their own judgment in the treatment of patients whose welfare is entrusted to them. The doctors furnish their own offices, office help and nurses, and the professional services are rendered in the doctors' offices or, when necessary, at the homes of the patients. The county contended that these physicians are not employees but are independent contractors and that therefore it is not necessary for the county to pay compensation insurance premiums on their salaries.

An independent contractor is classified as an employer and is defined by section 56-928(c) as:

> a person engaged in work for another, and who while so engaged is independent of the employer in the execution of the work, not subject to the rule or control of the person for whom the work is done, but is engaged only in the performance of a definite job, or piece of work, and subordinate to the employer only in effecting a result in accordance with the employer's design, . . .

In the exercise of the police power in promoting the health, safety and general welfare of the people, said the Supreme Court, the legislature has made it the mandatory duty of the county supervisors to provide medical attendance for the indigent sick. This legislation provides that the supervisors may appoint a doctor under a written contract to perform such services. It is noted, however, that the law vests in the board of supervisors the sole and exclusive jurisdiction to render such services. The authority to contract does not relieve the county supervisors of the duty and power to supervise the services. It is therefore apparent, the court continued, that the duty of caring for the indigent sick is a governmental function and is an exercise of the police power vested in the board of supervisors, and the board of supervisors may not delegate such power to any person over whom it does not retain supervision or control. The county urges, however, that the employment of professional men and women who by reason of their skill and ability are particularly fitted to do the work required of them does not create the relationship of employer and employee. "Supervision or control" as used in the workmen's compensation law does not mean that the board of supervisors may direct the thinking or direct the technical manner of performing the work or services of a doctor. This, however, does not change his "status" under the law. The employer, having the right to direct the time and the place in which the services are to be rendered, the persons to or for whom the services are to be rendered, and the degree and amount of said services, exercises supervision and control over the persons performing them. The board of supervisors must operate within its budget and must of necessity supervise and control the nature, the degree and the amount of work to be performed by the several doctors operating under the contracts. We therefore conclude, said the Supreme Court, that the doctors employed under the contracts in question are employees of the county and not independent contractors. Accordingly judgment was entered in favor of the Industrial Commission requiring the defendant county to report salaries, wages, commissions or fees paid to physicians under contract with the county and to pay to the state compensation fund the required insurance premiums thereon.—*Industrial Commission v. Navajo County, 167 P. (2d) 113 (Ariz., 1946).*

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1936 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied with stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

32:1-134 (July) 1946

Foreign Bodies in and in Relation to Thoracic Blood Vessels and Heart: II. Indications for Removal of Intracardiac Foreign Bodies and Behavior of Heart During Manipulation. D. E. Harken and P. M. Zoll.—p. 1.
*Experiences with Dicumarol (3,3'Methylene-Bis-[4-Hydroxycoumarin]) in Treatment of Coronary Thrombosis with Myocardial Infarction: Preliminary Report. I. S. Wright.—p. 20.
Neurovascular Syndrome as Manifested in Upper Extremities. R. Paull. —p. 32.
Potential Variations of Right Auricular and Ventricular Cavities in Man. H. H. Hecht.—p. 39.
Clinical Picture and Treatment of Later Stage of Trench Foot. D. I. Abramson, D. Lerner, H. B. Shumaker Jr. and F. K. Hick.—p. 52.
Construction of Cardiac Vector. R. F. Hill.—p. 72.
Incidence of Palpable Dorsalis Pedis and Posterior Tibial Pulsations in Soldiers: Analysis of Over 1,000 Infantry Soldiers. J. J. Silverman. —p. 82.
Rates of Water and Heat Loss from Respiratory Tract of Patients with Congestive Heart Failure Who Were from Subtropical Climate and Resting in Comfortable Atmosphere. G. E. Burch.—p. 88.
*Wolff-Parkinson-White Syndrome: Clinical Study, with Report of 9 Cases. D. Littmann and H. Tarnower.—p. 100.

Dicumarol in Coronary Thrombosis with Myocardial Infarction.—Patients selected for treatment with Dicumarol (3-3'-methylene-bis-[4-hydroxycoumarin]) had suffered repeated episodes of multiple thrombi in different areas of the coronary tree or the original thrombus had propagated. Others had had repeated embolic phenomena either pulmonary or to other areas or they gave evidence suggesting that both factor 1 and factor 2 were active. Forty-three patients qualified under one of these categories. Wright also gave Dicumarol to 33 patients with uncomplicated first or second attacks of coronary thrombosis. In addition to Dicumarol, all patients received conventional treatment. There was no evidence that Dicumarol aggravated or complicated the coronary thrombosis. In numerous cases the thrombosing and embolic tendencies were interrupted. The mortality rates for the complicated and uncomplicated cases of coronary thrombosis treated with Dicumarol appear to be lower than anticipated for each group. This study suggests that Dicumarol may be of value as a preventive measure against propagation, multiple serial attacks of coronary thrombosis within short intervals, mural and thebesian vein thrombosis and embolic phenomena following coronary thrombosis. There is no evidence that once Dicumarol has been discontinued and the blood prothrombin level has returned to normal any effect is exerted which decreases the risk of further attacks.

Wolff-Parkinson-White Syndrome.—Littmann and Tarnower think that the number of cases reported during the last few years would indicate that the syndrome of a short PR interval with a prolonged, aberrant QRS complex occurs much more frequently than has hitherto been realized. Nine cases came to their attention during one year in which approximately 3,600 electrocardiograms were reviewed. They think that the most acceptable explanation of the Wolff-Parkinson-White syndrome is that which assumes the presence of one and frequently several accessory conduction pathways which result in fusion beats. The influence of quinidine, atropine and exercise on the short PR, long and aberrant QRS complex in borderline cases may be employed as a diagnostic test. Several of the patients had systemic disease and 2 showed definite electrocardiographic abnormalities during periods of normal conduction.

American Journal of Clinical Pathology, Baltimore

16:347-412 (June) 1946

Study of Enzymes in Tissue Sections. G. Gomori.—p. 347.
Approaches to Study of Edema and Dehydration. F. W. Sunderman. —p. 353.
Metastatic Cancer of Extrahepatic Bile Ducts Producing Jaundice. P. A. Herbut and J. S. Watson.—p. 365.
Investigations on the Rh Property. P. Moureau.—p. 373.
*Improved Egg Yolk Infusion for Cultivation of Endameba Histolytica and Other Intestinal Protozoa. W. Balamuth.—p. 380.
Adenomyoepithelioma of Sweat Gland: Case. P. H. Hartz.—p. 385.
Note on Titration of Kline Antigen. B. S. Kline and H. Suessenguth. —p. 391.
Human Necrobacillosis, with Report of Death in a Sailor. J. L. Tullis and Olga E. Mordvin.—p. 395.
Note on Genital Fusospirochetosis. M. Lev and E. B. Tucker.—p. 401.
Confusion in Typing of Stored Blood: An Irregular Isoagglutinogen. R. L. Fruin.—p. 405.

Egg Yolk Infusion for Cultivation of Endameba Histolytica.—According to Balamuth intestinal amebas, including Endameba histolytica, may be cultivated in a buffered aqueous egg yolk infusion in the presence of a mixed bacterial flora. The advantages of this culture medium over others include ease of preparation from ingredients which are easily available, maximal growth of amebas, and relatively less overgrowth by bacteria and Blastocystis. Dehydrated egg yolk can be used as a substitute for fresh eggs since it provides a considerable saving in time and expense and insures a more constant source of supply and a more standardized product. A major problem that still confronts research in this field is the achievement of bacteria-free cultivation of E. histolytica.

American Journal of Physiology, Baltimore

146:319-490 (June) 1946. **Partial Index**

Renal Clearance of Essential Amino Acids: Tryptophan, Leucine, Isoleucine and Valine. K. H. Beyer, L. D. Wright, H. F. Russo, Helen R. Skeggs and Elizabeth A. Patch.—p. 330.
Acclimatization to Extreme Heat and Its Effect on Ability to Work in Less Severe Environments. S. M. Horvath and W. B. Shelley.—p. 336.
Bulbar Inhibitory Mechanism in Concussion. R. Rhines, H. W. Magoun and W. F. Windle.—p. 344.
Renal Clearance of Thiosulfate, with Observations on Its Volume Distribution. A. Gilman, F. S. Philips and E. S. Koelle.—p. 348.
Rate of Water Loss from Skin of Foot of Normal and Trench Foot Subjects. G. E. Burch, H. L. Myers, R. R. Porter and N. Schaffer. —p. 370.
Are Mass Discharges Characteristic of Central Autonomic Structures? E. Gellhorn, Ruth Cortell and J. P. Murphy.—p. 376.
Oxygen Consumption for Men of Various Sizes in Simulated Piloting of Plane. P. V. Karpovich and R. R. Ronkin.—p. 394.
Regulation of Arterial Blood Pressure. J. P. Holt, W. J. Rashkind, R. Bernstein and J. G. Greisen.—p. 410.
Observations of Effects of Training on Pulse Rate, Blood Pressure and Endurance, in Humans, Using Step Test (Harvard), Treadmill and Electrodynamic Brake Bicycle Ergometer. R. C. Cogswell, C. R. Henderson and G. H. Berryman.—p. 422.
Value of Alkalinizing Agents in Preventing Transition from Impending to Irreversible Hemorrhagic Shock. H. C. Wiggers and R. C. Ingraham.—p. 431.
Comparison of Effects of Thiouracil and Thyroidectomy on Some Phases of Metabolism in Rat. A. S. Gordon, E. D. Goldsmith and H. A. Charipper.—p. 439.
Observations on Interaction of Nerve Impulses in Gray Matter and on Nature of Central Inhibition. B. Renshaw.—p. 443.
Effect of Hemorrhage on Gastrointestinal Motility of Dogs: Gradient of Gastrointestinal Motility. H. Necheles, L. Walker and W. H. Olson.—p. 449.
*Influence of Placebo, Body Position and Medication on Motion Sickness. D. B. Tyler.—p. 458.
Circulatory Effects of Partial Cerebral Ischemia. D. F. Opdyke.—p. 467.

Influence of Placebo, Position and Medication on Motion Sickness.—Tyler made controlled studies of some of the factors that affect the incidence of seasickness in large unselected groups. This report deals with three such factors: (1) the effect of a placebo (psychogenic factor), (2) the effect of body position and (3) the prophylactic actions of various belladonna alkaloid and barbiturate preparations. Some 60 experiments were made involving more than 15,000 unselected young men. There was no "placebo" effect. The incidence and the severity of sickness which developed in groups receiving a placebo and in untreated control groups were of the same order. In landing craft the position of the body and/or head is a potent factor in determining the incidence and severity of seasickness. Scopolamine alone or combined with hyoscyamine, atropine or certain barbiturates is an effective medication for the prevention of seasickness.

American Journal of Surgery, New York

72:1-144 (July) 1946

Surgical Treatment of Jejunal Ulcer. L. S. Fallis and K. W. Warren. —p. 4.
Correction of Congenital Protruding Ear: New Surgical Concept. R. C. Seeley.—p. 12.
Comfort in Cases of Anorectal Surgery. R. L. Belt.—p. 16.
Spondylolysis and Its Relation to Spondylolisthesis. M. P. Rhodes and C. Colangelo.—p. 20.
Duodenal Injuries. W. H. Cave.—p. 26.
Intravenous Sodium Pentothal as Basal Anesthetic. E. V. Deutsch and J. Herzlich.—p. 32.
Does Anterior Gastrojejunostomy Predispose to Development of Jejunal Ulceration? Study Based on 90 Partial Gastrectomies. C. S. Kennedy and R. P. Reynolds.—p. 36.
Finger Amputations. G. J. Curry.—p. 40.
Interlaminar Spinal Anesthesia: Alternative Lateral Approach for Subarachnoid Puncture. D. Kershner and A. L. Shapiro.—p. 43.
Further Experience with Continuous Caudal Analgesia in Obstetrics. W. Levine, H. Taller and A. Light.—p. 47.
Traumatic Palmar Aneurysm. I. C. Zuckerman and S. E. Proctor. —p. 52.
Inspissated Blood and Growth of Fibromatous Uterine Tumors: Preliminary Report. W. Marshall, A. L. Holloway, L. E. Irby and C. Peacock.—p. 57.
Varicosities of Lower Extremity: Description of Improved Method of Testing for Incompetent Communicating Veins. G. T. McCutchen. —p. 63.
Further Study of Early Postoperative Ambulation. V. D'Ingianni and Hazel Ann D'Ingianni.—p. 66.
Direct Inguinal Hernia. H. E. Stein.—p. 68.
Relief of Pain in Osteoarthritis of Hip Joint. B. Judovich and G. Nobel. —p. 72.
Receded Chin: Its Correction with Preserved Cartilage. G. D. Wolf. —p. 74.
Saphenous Vein as Intravenous Route. J. J. Vallone.—p. 78.

Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

30:305-404 (July) 1946

Asymptomatic Neurosyphilis: Review of Literature: R. D. Hahn and E. G. Clark.—p. 305.
*Clinical Significance of Quantitative Serologic Tests for Syphilis. E. W. Thomas.—p. 317.
*Neurosyphilis in Younger Age Groups: Analysis of Clinical Findings, Laboratory Studies and Malaria Therapy. S. Scherlis and C. M. Caravati.—p. 330.
Merthiolate (Sodium Ethyl Mercuri Thiosalicylate) as Preservative in Serums for Serodiagnosis of Syphilis. C. R. Rein and H. N. Bossak. —p. 342.
Semantic Confusion and Resolution in Concepts of Cure in Syphilis and of Reinfection with Syphilis. M. Leider.—p. 344.
Sensitivity of Hemophilus Ducreyi to Antibiotic and Other Substances in Vitro. F. Mortara and Margaret T. Saito.—p. 352.
Observations on Chancroid Therapy With and Without Sulfathiazole. V. C. Harp Jr.—p. 361.
Sulfathiazole Prophylaxis for Gonorrhea and Chancroid Among Soldiers in Caribbean Area. D. Bergsma.—p. 368.
Technics Accentuating Efficiency and Speed in Gonococcus Culture Work. G. M. Cameron and Ruth Castles.—p. 381.
Comparative Study of Mediums for Primary Isolation of Gonococcus. T. H. Weller and J. E. Williams.—p. 386.

Quantitative Serologic Tests for Syphilis.—Thomas reports the experience with the quantitative serologic tests for syphilis at Bellevue Hospital over the past five and one-half years. Patients with negative spinal fluid findings but persistently low blood titers of less than 10 for more than one year after rapid treatment for primary or secondary syphilis require no further therapy unless rises in titers occur. Patients treated for primary and secondary syphilis who develop new infectious lesions or have rises in titers some months after rapid treatment should be retreated as soon as possible. Patients treated for primary or secondary syphilis who continue to have complement fixation titers of 20 or greater, or quantitative flocculation tests of 32 or greater, nine months after rapid therapy, should be retreated. Patients who continue to have complement fixation titers between 10 and 20, or quantitative flocculation tests between 8 and 16, nine months after rapid therapy, may be retreated as a precautionary measure, but one should not expect rapid drops in the titers of such patients after retreatment. Patients given rapid treatment for early latent syphilis of less than six months' duration may be expected to become seronegative within one year after treatment. The persistence of low titers in such patients for more than one year is not an indication for further treatment. Patients with latent syphilis of more than six months' duration as a rule require more than one year to become completely seronegative. In general, the longer the duration of latent syphilis the longer the time required for the serologic tests to become negative. Retreatment is not indicated for such patients unless the follow-up titers show sustained rises. The aim of treatment in late latent or late syphilis is not to obtain negative serologic tests but to prevent further progress of the disease. In syphilis of the central nervous system the spinal fluid findings are the only reliable guides to treatment.

Neurosyphilis in Younger Age Groups.—Scherlis and Caravati state that of 128 patients with neurosyphilis at Woodrow Wilson General Hospital 90.7 per cent were between 20 and 40 years of age. Only 1 patient was under 20 years of age, and only 1 older than 50. This age group is younger than is usually reported. Only 66 patients gave a trustworthy history of a chancre or secondary eruption. Routine examination of the spinal fluid showed the presence of neurosyphilis in 108 cases, while in only 20 cases was the diagnosis established following investigation of some specific complaint. Information on the duration of syphilis was available in 69 cases, and in 26 of these it was less than two years and in 13 others it was between two and five years before the diagnosis of neurosyphilis was made. Seven of the 128 patients with neurosyphilis had both negative Kahn and Wassermann tests of the blood, but each of these had had at least some antisyphilitic therapy. Of 75 patients with symptomatic neurosyphilis 61 had ocular abnormalities, and 94.6 per cent of these had abnormal pupils. The incidence of ocular abnormalities increased as the duration of syphilis increased. Spinal fluid and ocular abnormalities were often considerable when the duration of the syphilitic infection was only a few years. In the administration of therapeutic malaria Negroes were given Plasmodium malariae, white patients Plasmodium vivax. Each was allowed to have ten bouts of fever unless some complication developed. Reinoculation was necessary in 10 instances to obtain the desired number of fifty hours of fever over 104 F. The period of observation after treatment was too short to evaluate accurately the effectiveness of therapy.

Annals of Internal Medicine, Lancaster, Pa.

25:1-194 (July) 1946

Essential Oral Hyperthermia: Report of Study of 25 Cases of Low Grade "Fever." E. M. Rappaport.—p. 1.
*Nephrotic Phase: Its Frequency of Occurrence and Its Differential Diagnostic Value in Determining Nature of Renal Lesion in 120 Patients Who Died of Renal Failure. W. L. Bloom and D. Seegal. —p. 15.
Medicolegal Problems in Distinguishing Accident from Suicide. O. Richardson and H. S. Breyfogle.—p. 22.
*Penicillin in Treatment of Putrid Lung Abscess. B. P. Stivelman and J. Kavee.—p. 66.
Treatment of Various Infections with Penicillin X, with Preliminary Note on Value of Penicillin X in Scarlet Fever. H. L. Hirsh, H. F. Dowling and L. K. Sweet.—p. 78.
Serum Amylase and Serum Lipase in Mumps. S. Candel and M. C. Wheelock.—p. 88.
Prothrombinopenic Effect of Massive Salicylate Therapy in Acute Rheumatic Fever. G. C. Owen and H. A. Bradford.—p. 97.
Plasmochin Toxicity: Analysis of 258 Cases. M. Hardgrove and I. L. Applebaum.—p. 103.
Infectious Mononucleosis: Report of Epidemic in an Army Post: I. H. F. Wechsler, A. H. Rosenblum and C. T. Sills.—p. 113.
*Myxedema Controlled by Thyroid Extract for Fifty-Two Years: Case. A. M. Burgess.—p. 146.

Nephrotic Phase.—Bloom and Seegal studied 120 fatal cases of renal failure. These consisted of 50 instances of chronic glomerulonephritis, 50 of arteriolarnephrosclerosis and 20 of chronic pyelonephritis. Those patients were considered in a nephrotic phase who showed albuminuria, hypoproteinemia, hypercholesterolemia and edema. Twenty-seven (54 per cent) of the patients with chronic glomerulonephritis had a typical nephrotic phase. In an additional 10 patients (20 per cent) one or more of the classic signs were seen. In only 13 patients (26 per cent) with chronic glomerulonephritis was there a complete absence of the findings usually associated with the diagnosis of the nephrotic phase. In the series of 50 patients who died of arteriolarnephrosclerosis there was 1 patient having the nephrotic phase and there was only 1 patient in the pyelonephritis series with findings suggestive of the nephrotic phase. Thus the opinion is confirmed that the nephrotic phase is frequently observed during the course of chronic glomerulonephritis and that it is a rare phenomenon during the course of chronic

pyelonephritis or arteriolarnephrosclerosis. The presence of a nephrotic phase is therefore a useful differential diagnostic factor in the diagnosis of the cause of renal failure. The nephrotic phase may extend over a period up to five years; the average duration in these patients was twenty-two and one-half months. Evidence of a repetitive necrotic phase was not observed in this series.

Penicillin in Treatment of Putrid Lung Abscess.—Stivelman and Kavee administered penicillin to 13 patients with putrid lung abscesses. Six of these patients, 3 men between the ages of 21 and 49 years and 3 women between the ages of 28 and 37, had an acute putrid lung abscess, and 7 patients had a chronic putrid lung abscess. Twenty-five thousand units of sodium salt of penicillin was given intramuscularly every three hours. Sulfadiazine was employed concurrently, although used by itself it had no appreciable effect on a small series of patients so treated. All patients with acute putrid lung abscess became free from local and constitutional symptoms. Improvement in weight and strength was evident. In 5 patients there was a complete recovery from the disease as judged from the roentgenograms. In one a previously observed encapsulated exudate remained symptom free and unchanged. In 5 of the patients with chronic putrid lung abscess the treatment with penicillin and sulfadiazine was followed by decided improvement of the toxic manifestations. Serial chest roentgenograms revealed definite regression of the lesion in 2 patients and pronounced improvement in 1. There were no septic or metastatic complications while under treatment and all 7 patients became better surgical risks after penicillin-sulfadiazine treatment than they were before the treatment was instituted. In chronic putrid abscess this method of treatment should be started preparatory to surgical intervention and continued after operation until all toxic symptoms disappear.

Myxedema Controlled by Thyroid for Fifty-Two Years—Burgess reports that a woman who developed severe myxedema at the age of 35 was put on thyroid at the age of 39 and died from bronchopneumonia when almost 92 years old. The patient was one of the earliest with myxedema who received thyroid. The subsequent duration of life on thyroid treatment was probably the longest yet recorded. The patient lived normally many years beyond her expectation of life in spite of the fact that during at least the last twenty years she suffered from pronounced hypertensive and arteriosclerotic heart disease. A dose of one 3½ grain (0.22 Gm.) tablet of thyroid daily was low enough to keep her fairly free from anginal attacks and high enough to prevent her from developing symptoms of myxedema. Necropsy revealed bronchopneumonia, atrophy and fibrosis of the thyroid gland and generalized arteriosclerosis.

Archives of Internal Medicine, Chicago

78:1-124 (July) 1946

*Gonococcic Peritonitis of Upper Part of Abdomen in Young Women (Phrenic Reaction, or Subcostal Syndrome of Stajano; Fitz-Hugh-Curtis Syndrome): Report of Cases of 3 Patients Treated Successfully with Penicillin and Summary of Literature. M. M. Stanley.—p. 1.
*Myelofibrosis, Splenomegaly and Megakaryocytic Myelosis: Case. H. W. Crail.—p. 14.
Effect of Atropine on Branham Sign in Arteriovenous Fistula. M. L. Kramer and J. W. Kahn.—p. 28.
Precordial Leads in Children. A. Battro and J. C. Mendy.—p. 31.
*Fatal Mercurial Poisoning Following Prolonged Administration of Mercurophylline. S. O. Waife and P. T. Pratt.—p. 42.
Infectious Mononucleosis: Consideration of Complications and Preliminary Report on Use of Penicillin in This Disease. F. T. Joyce.—p. 49.
Plasma Quinacrine Concentration as Function of Dosage and Environment: Joint Report of Armored Medical Research Laboratory, Fort Knox, Ky., and Commission on Tropical Diseases, Army Epidemiological Board, Preventive Medicine Service, Office of the Surgeon General, United States Army.—p. 64.
Allergy: Review of Literature of 1944 and 1945, with Comments on Future Problems. F. M. Rackemann.—p. 108.

Gonococcic Peritonitis.—Stanley reports 3 cases of gonococcic perihepatitis, all of which were treated with penicillin, with prompt recovery. Women in whom the syndrome develops invariably have had an antecedent gonococcic infection, sometimes as long as five years before. The onset is usually dramatic, with a sudden excruciating pain in the upper part of the abdomen, often referred to the shoulder. It is of the pleuritic type, exaggerated by deep breathing, coughing or laughing or by bending or walking. Trauma of inflamed pelvic organs, in the form of surgical procedures, gynecologic examination, intercourse or douching, may precipitate the development of this complication. Culture of the cervical or urethral secretions yields gonococci. Gonococcus vaccine, hyperpyrexia and the various sulfonamide compounds have been used with varying success in the past, but at present penicillin is the drug of choice. Doses of 20,000 units administered every three hours intramuscularly usually relieve the symptoms completely within twenty-four hours. The disease occurs more frequently than is generally believed and should be considered in the differential diagnosis of young women in whom an acute pain develops in the upper part of the abdomen, particularly on the right side. It is often misdiagnosed as acute cholecystitis. The importance of correct diagnosis is obvious, since surgical intervention not only is not necessary but may be harmful.

Splenomegaly and Myelosis.—Crail reports that a woman aged 36, following delivery, developed a chronic progressive illness associated with splenomegaly. Clinically it gave the appearance of a typical myelogenous leukemia with megakaryocytosis. Necropsy revealed myelofibrosis, extramedullary hemopoiesis and atypical miliary tubercles massively infested with acid fast, gram positive bacilli; leukemic infiltrations were absent. The clinical course had been interpreted as an unusually acute phase of myelogenous leukemia, but after microscopic examination the possibility of tuberculosis was considered. It is suggested that these cases represent the result of human infection with avian tuberculosis.

Fatal Poisoning from Mercurophylline.—Waife and Pratt report what appears to be the first instance of a mercurial toxic nephrosis with anuria and death after the usual course of repeated parenteral injections of mercurophylline. A women aged 35, with rheumatic heart disease and cardiac decompensation, received mercurophylline parenterally for six months and developed an acute anuria, fatal in spite of bilateral decapsulation of the kidney. Postmortem examination revealed nephrosis, hemorrhage in the ileum and colon and focal areas of necrosis and hemorrhage in the liver. Mercury was found in the liver and kidney. Death was attributed to mercurial intoxication.

Archives of Pathology, Chicago

41:565-686 (June) 1946

Local Tissue Reactivity (Shwartzman Phenomenon) in Heart and Femoral Artery of Rabbit. C. G. Tedeschi.—p. 565.
*Chorionic Gonadotropin in Diagnosis of Testicular Tumors. J. I. Brewer.—p. 580.
Toxicity and Detoxication of Cinchophen: Experimental Studies. W. C. Hueper.—p. 592.
Human Strongyloidiasis with Internal Autoinfection. P. H. Hartz.—p. 601.
Tropical Ulcer in Guatemala: Pathologic, Bacteriologic, Mycologic and Clinical Aspects. A. Golden and E. Padilla.—p. 612.
*Ethylene Glycol Poisoning, with Suggestions for Its Treatment as Oxalate Poisoning. G. Milles.—p. 631.
Etiologic Concepts and Pathologic Aspects of Ainhum. B. H. Kean and H. A. Tucker.—p. 639.
Primary Cystic Tumor of Diaphragm. O. B. Scott and D. R. Morton.—p. 645.
Development of Sebaceous Glands from Intralobular Ducts of Parotid Gland. P. H. Hartz.—p. 651.

Gonadotropin in Tumors of Testis.—One of Brewer's patients had teratoma of the testis and the other a seminoma. Biologic tests for chorionic gonadotropin were positive in both. Two distinct types of gonadotropin test reactions, representing two different gonadotropin substances, have been observed in cases of testicular tumor. One is the chorionic type of gonadotropin identical with that found in the urine of pregnant women. The other is the castrate type elaborated in the pituitary gland, found in castrates, male and female, in women past the menopause and in elderly men. In cases of testicular tumor distinction should be made between these two reactions, because chorionic gonadotropin in the urine of a patient with a testicular tumor indicates that chorionic tissue is present. The chorionic tissue may not be demonstrated in the primary tumor because it may be but a small part of the growth, because the entire tumor is not examined microscopically or

because it is impossible microscopically to differentiate chorionic tissue from the multiple and varied tissues of a testicular tumor. In the author's 2 cases a test of the urine for chorionic gonadotropin indicated that chorionic tissue was present in the primary tumor even though such tissue was not identified microscopically. That chorionic tissue was present was subsequently proved by the metastases, which in each instance were choriocarcinoma. If chorionic gonadotropin is present in the urine of a patient with a testicular tumor, it indicates the diagnosis of choriocarcinoma even though chorionic tissue is not identified microscopically in the primary tumor.

Ethylene Glycol Poisoning.—A man aged 30, who was admitted to the hospital with a history of having drunk antifreeze solution about four hours previously, died about twenty-two hours after ingesting the fluid. Traces of ethylene glycol were demonstrated in the stomach contents aspirated about ten hours after its ingestion. A sample of the radiator fluid submitted for analysis was found to contain about 50 per cent ethylene glycol. The man had drunk not more than 500 cc. Necropsy was done and the fluid which the man was said to have drunk was administered to several cats by stomach tube. The author concludes that in man ethylene glycol is a rapidly acting poison; the fatal dose for cats is as low as 1.5 cc. per kilogram (3 cc. per kilogram of antifreeze fluid containing ethylene glycol in the concentration of 50 per cent). Ethylene glycol taken by mouth is rapidly oxidized to oxalic acid. Oxalate crystals are deposited in abundance in the renal tubules. Death may result from renal failure or acute cardiac failure and pulmonary edema. Treatment directed at oxalate poisoning is suggested. Ethylene glycol is poisonous when ingested, and the container in which it is sold should be so labeled.

Archives of Physical Medicine, Chicago

27:409-462 (July) 1946

Heberden's Nodes: Their Relation to Other Degenerative Joint Diseases. R. M. Stecher.—p. 409.
Physical Reconditioning of Knee Following Removal of Menisci. F. L. Licbolt and J. J. Stein.—p. 413.
Neurosyphilis, with Three Year Observation of Comparative Therapeutic Effects of Inoculation Malaria and Artificial Fever Therapy. V. E. Lascara.—p. 417.
Graphic Method for Rapid Estimation of Clinical Status in Poliomyelitis. E. T. Williams, F. T. Top and Louise Suchomel.—p. 430.

Arkansas Medical Society Journal, Fort Smith

43:44-70 (July) 1946

Early Ambulation Following Surgical Procedures. H. G. Hollenberg. —p. 45.
Modern Concepts of Cardiovascular Disease. C. T. Chamberlain.—p. 48.
Résumé of Foreign Bodies Removed from Food and Air Passages from Oct. 1, 1944 to Oct. 1, 1945. P. L. Mahoney.—p. 50.

43:71-88 (Aug.) 1946

Status of General Practitioner, Present and Future. S. A. Thompson and S. B. Thompson.—p. 71.
Modern Concepts of Cardiovascular Disease: Treatment of Coronary Thrombosis. C. T. Chamberlain.—p. 77.

Gastroenterology, Baltimore

6:477-644 (June) 1946

Incidence of Gastrointestinal Disorders from Study of 2,839 Cases. E. S. Emery Jr.—p. 477.
Regional Enteritis in Puerto Rico. F. Asencio-Camacho.—p. 493.
Epidemiologic Study of Outbreak of Infectious Hepatitis. M. L. Hayward.—p. 504.
*Chronic Gastritis: Observations on Its Course and Significance. S. M. Maimon and W. L. Palmer.—p. 511.
Results of High Caloric Feeding. J. I. Goodman and R. O. Garvin. —p. 537.
Problems of Etiology of Peptic Ulcer: Resistance of Gastrointestinal Tract to Digestive Action of Its Own Secretions. W. H. Bachrach, M. I. Grossman and A. C. Ivy.—p. 563.
Things to Do if Cancer of Stomach Is Oftener to Be Cured: Report of Instructive Case. W. C. Alvarez.—p. 574.
Consistency, Opacity and Columnar Cell Content of Gastric Mucus Secreted Under Influence of Several Mild Irritants. F. Hollander, J. Stein and Frances U. Lauber.—p. 576.
Isolated Hodgkin's Disease of Stomach. D. C. Browne and G. McHardy.—p. 596.

Chronic Gastritis.—Maimon and Palmer report the changes observed gastroscopically in the stomachs of 14 patients who were repeatedly examined for periods ranging from eight months to eleven years. They found that chronic gastritis tends toward a persistent or recurrent course with unpredictable variations in type, severity and location. Repeated examinations of 2 patients with consistently normal findings suggest the tendency of the normal stomach to remain normal. On the other hand, phases of normality were not infrequently found in stomachs usually exhibiting chronic gastritis. Superficial and hypertrophic gastritis may be variations of the same process rather than separate and distinct entities. Atrophic changes were constant for periods up to five years; in some cases atrophic gastritis seemed to appear as a sequel of hypertrophic and superficial gastritis. Severe atrophic gastritis tends to persist, but return to normal has been observed. Atrophic changes are more frequent in the upper third of the stomach, whereas superficial and hypertrophic changes occur more often in the middle portion. Gastritis of various types has been observed over periods up to eleven years without serious consequence. It has not been possible to correlate the appearance of the gastric mucosa with definite symptoms in the 14 patients examined repeatedly. While mucosal changes were observed in 6 patients subjected to roentgen therapy, the type of change was not constant. Two patients with superficial and hypertrophic gastritis prior to supradiaphragmatic bilateral vagotomy had only superficial changes after the operation. The clinical significance of chronic gastritis remains unproved.

Geriatrics, Minneapolis

1:269-336 (July-Aug.) 1946

Management of Parenteral Fluids in Geriatrics. C. E. Koop.—p. 269.
*Tonsils and Aging. G. Kelemen.—p. 277.
Are Geriatrics Mortality and Morbidity Statistics Reliable? A. Mueller-Deham. —p. 285.
Reported Effects of Antireticulocytotoxic Serum Developed in Russia. S. J. McDonough.—p. 295.
Army of Aged: Sociomedical Problem. Belle B. Beard.—p. 299.
What Is Old Age? L. A. Miller.—p. 305.

Tonsils and Aging.—Kelemen examined microscopically fifty pairs of tonsils removed by surgical intervention from persons in the sixth decade of life. In this period tonsils may be found in all stages of development, with two thirds well on their way to regression. Involution in the palatine tonsils is a quantitative atrophy. The cells and tissues decrease in number without degeneration before their final disappearance. Around the sixth decade there is a period of high tonsillar activity; regression seems to cease and there may be a slight temporary enlargement. This period of increased tonsillar activity at the onset of senescence corresponds to the similar period before puberty. Additional clinical observations were made on 309 persons between the ages of 61 and 103 years. With advancing age a steady decline in the size of the tonsils was noted, but complete disappearance was rare; it was much less frequent than the presence of large fully developed tonsils. Local inflammations, tonsillar and peritonsillar, are infrequent and take the same course as in other age groups. The attack may be the first one and may involve small remnants or regenerates after tonsillectomy. No greater operative risk was present in the aged than in the young. Regeneration occurred after tonsillectomy had been performed in the seventh decade. With the recognition of the persistence of the tonsils even in the highest age groups preventive geriatrics should observe these organs carefully at the threshold of the regressive years, since some diseases in the aged may be ascribed to the tonsils.

Iowa State Medical Society Journal, Des Moines

36:279-344 (July) 1946

Recent Developments in Hospital Organization and Medical Practice That May Affect Future. W. A. O'Brien.—p. 279.
Present Day Concepts of Fracture Management. D. C. Conzett.—p. 282.
Clinical Significance of Rh Factor. E. L. DeGowin.—p. 285.
Aviation Deafness. B. M. Merkel.—p. 288.

36:345-384 (Aug.) 1946

Thyroid Disease. H. H. Searls.—p. 345.
Thiouracil in Treatment of Graves' Disease. H. M. Korns.—p. 349.
Ruptured Intracranial Aneurysms. A. A. Sahs.—p. 352.
Subacute Bacterial Endocarditis in Patient with Congenital Heart Disease: Cure with Penicillin. Julia Cole and M. L. McCreedy.—p. 358.
Survey on Uses of Penicillin in Diseases of Eye. M. O. Eiel.—p. 359.

Journal of Nutrition, Philadelphia

32:1-120 (July) 1946

*Comparison of Thiamine Synthesis and Excretion in Human Subjects on Synthetic and Natural Diets. Milicent L. Hathaway and Juniata E. Strom.—p. 1.
Comparison of Riboflavin Synthesis and Excretion in Human Subjects on Synthetic and Natural Diets. Milicent L. Hathaway and Dorothy E. Lobb.—p. 9.
Development and Demonstration of Corneal Vascularization in Rats Deficient in Vitamin A and in Riboflavin. L. L. Bowles, L. Allen, V. P. Sydenstricker, C. W. Hock and W. K. Hall.—p. 19.
Attempts to Produce Niacin Deficiency in Rhesus Monkey. J. M. Cooperman, K. B. McCall, W. R. Ruegamer and C. A. Elvehjem.—p. 37.
Nutritional Significance of Inositol and Biotin for Pig. D. C. Lindley and T. J. Cunha.—p. 47.
Cobalt Metabolism Studies: II. Partition of Radioactive Cobalt by Rumen Fistula Cow. C. L. Comar, G. K. Davis, Ruth F. Taylor, C. F. Huffman and R. E. Ely.—p. 61.
Studies on Comparative Nutritive Value of Fats: IX. Digestibility of Margarine Fat in Human Subjects. H. J. Deuel Jr.—p. 69.
Nicotinic Acid, Biotin and Pantothenic Acid Content of Cow's Milk. J. M. Lawrence, B. L. Herrington and L. A. Maynard.—p. 73.
Effect of Liver Extracts on Utilization of Casein for Growth. D. K. Bosshardt, Mary M. Ayres, Laura C. Ydse and R. H. Barnes.—p. 93.
Use of Dog for Studies on Iron Availability. W. R. Ruegamer, L. Michaud, E. B. Hart and C. A. Elvehjem.—p. 101.
Self Selection of Diet: II. Effect of Flavor. E. M. Scott and Eleanor Quint.—p. 113.

Thiamine Synthesis and Excretion.—Hathaway and Strom maintained 3 healthy women on a synthetic diet containing 1 mg. of thiamine a day for seven weeks. This diet was followed, after a month's respite, by a diet of natural foods containing 0.84 mg. of thiamine per day. Excretion of thiamine in the urine was measured daily and in the feces by five day periods. Daily urinary thiamine values averaged 116, 113 and 147 micrograms on the synthetic diet and 90, 91 and 112 micrograms on the natural diet. The average values for daily excretion of "free" thiamine in the feces were 17, 15 and 13 micrograms on the synthetic diet and 25, 49 and 35 micrograms on the natural diet. "Combined" thiamine of the feces was 2.4, 5.1 and 4.5 times higher on the natural than on the synthetic diet, suggesting that the synthetic diet was less favorable for bacterial synthesis of thiamine than the natural diet. The facts that urinary thiamine excretions on the natural diet reflected the lowered thiamine intake and that increases in fecal excretion of "free" thiamine were small might indicate that fecal synthesis of thiamine was not an important factor in the thiamine economy of these 3 subjects. The excretions of thiamine by these subjects and their apparent well being on thiamine intakes of 0.84 to 1 mg. support the lowering of the recommended daily allowance for women to 1.1 or 1.2 mg. per day.

Journal of Urology, Baltimore

56:1-150 (July) 1946. **Partial Index**

Aneurysm of Renal Artery Following Partial Nephrectomy. P. J. Kahle and J. R. Schenken.—p. 1.
Massive Perirenal Lipoma, with Report of Case. G. E. Pfeiffer and M. M. Gandin.—p. 12.
Use of Alloy Stainless Steel Wire in Closing Urologic Wounds. N. B. Powell.—p. 35.
Cystoscopic Transureteral Extraction of Stone Located in Renal Pelvis. M. Ellik.—p. 46.
Vaginal Ureterolithotomy. F. K. Garvey and D. Gomberg.—p. 49.
Gunshot Wounds of Urinary Bladder in Wartime. E. P. Niceley.—p. 59.
Crush Injury Syndrome Following Prolonged Tourniquet Action. D. W. Atcheson.—p. 68.
Primary Spindle Cell Sarcoma of Urinary Bladder with Solitary Metastasis to Heart Muscle: Case Report. A. F. Luhr Jr.—p. 78.
Giant Prostate: Largest Recorded. N. F. Ockerblad.—p. 81.
Benign Prostatic Obstruction: Comparison of Results Following Suprapubic, Transurethral and Perineal Operative Procedures. D. R. Higbee.—p. 83.
Survival Following Castration for Prostatic Cancer. S. A. Vest and T. H. Frazier.—p. 97.
Endothelioma of Penis: Case Report, with Survey of Literature. W. M. Coppridge, G. H. Putnam and J. B. Miale.—p. 112.
Fibrous Cavernositis: Further Observation, with Report of 31 Additional Cases. C. E. Burford, J. E. Glenn and E. H. Burford.—p. 118.
Prevention of Urinary Tract Infection Following Transurethral Prostatic Resection by Combined Use of Sulfadiazine and Penicillin. C. L. Prince.—p. 121.
Venous Thrombosis and Pulmonary Emboli in Urology. F. H. Colby.—p. 124.
Reduplication of Urethra. C. B. Moore.—p. 130.
Male Fertility as Seen in Artificial Insemination. A. Koerner.—p. 133.
Psychosomatic Problems in Urology. R. E. Cone.—p. 146.

Nebraska State Medical Journal, Lincoln

31:261-308 (July) 1946

Epilepsy. S. N. Berens.—p. 264.
Diagnosis and Management of Head Injuries for First Forty-Eight Hours. E. A. Connolly.—p. 268.
Delayed Surgical Complications of Head Injuries. J. J. Keegan.—p. 272.
Psychiatric Aspects of Head Injury. A. E. Bennett.—p. 276.
Head Injuries: Follow-Up Studies After Forty-Eight Hours. E. J. Kirk.—p. 279.
Malaria: Problem in Care of Military Service Veteran. F. Long.—p. 282.

31:309-344 (Aug.) 1946

Indications for Open Reduction of Fractures. G. A. Caldwell.—p. 313.
Carcinoma of Prostate—Fundamentals of Present Day Treatment. L. W. Lee and E. Davis.—p. 316.
Nebraska Medical Service. A. J. Offerman.—p. 319.
Opaque Media in X-Ray Diagnosis. F. L. Simonds.—p. 326.

New England Journal of Medicine, Boston

235:35-70 (July 11) 1946

*Gangrene of Hand Following Treatment for Pruritus of Hepatotoxic Origin. F. R. Kenney.—p. 35.
*Dick Test in Military Personnel, with Special Reference to Pathogenesis of Skin Reaction. L. A. Rantz, P. J. Boisvert and W. W. Spink.—p. 39.
Primitive Medicine. M. F. A. Montagu.—p. 43.
Ureteral Catheterization. C. A. Haysmer.—p. 49.
Endoscopy (concluded). E. B. Benedict.—p. 50.
Malignant Lymphoma Involving Retroperitoneal Tissues and Meninges of Spinal Cord.—p. 65.
Acute and Chronic Cholecystitis.—p. 67.

Gangrene of Hand.—Kenney reports a case of subacute yellow atrophy caused by toxic hepatitis in a woman aged 56. There was jaundice and severe pruritus. Ergotamine tartrate was given in doses of 1 mg. twice daily for the control of itching. The pruritus was fairly well controlled by the drug, the total dosage having reached 26 mg., when it was discontinued because of the color of the hands, which had become a constant dusky pale blue, and because the brachial and the axillary pulsations had disappeared. Gangrene of the right hand occurred within three weeks after cervical sympathetic block was done and in spite of subcutaneous administration of papaverine hydrochloride. If ergotamine tartrate is to be used as an antipruritic, the patient should be examined at least once daily for pain, coldness, cyanosis, loss of arterial pulsations, impaired sensation and tingling of the extremities. The drug should be immediately discontinued should any of these signs occur. Appropriate therapy includes papaverine hydrochloride 0.02-0.03 Gm. intravenously or orally or both; ephedrine 24 mg. orally; alcohol 15 cc. every four hours orally; magnesium sulfate intravenously; 1 per cent pilocarpine 1 cc. subcutaneously; acetylcholine and sympathetic block with procaine hydrochloride. The use of ergotamine tartrate is contraindicated in the presence of a septic state, cardiovascular disease and obliterative vascular disease. It should be employed with caution in cases of hepatic or renal disease, arteriosclerosis and hypersensitivity to the drug.

Dick Test.—Rantz and his associates studied the skin reaction to Dick toxin of 1,280 white men in military service suffering from acute respiratory disease. The test was positive in 27.8 per cent. The incidence of positive Dick reactions was the same in men admitted to the hospital with virus type respiratory disease as in those with group A hemolytic streptococcus sore throat, demonstrating that there is no relation between the Dick reaction and immunity to infection by hemolytic streptococci. The frequency of positive reactions was least in men over 20 years of age and in those who had had more than twelve months of military service. Positive Dick reactions were infrequent in men whose premilitary residence had been in a geographic area in which the incidence of hemolytic streptococcus disease is known to be low (in the border states, the Southeast and Southwest). Exposure to the hemolytic streptococcus is essential for the establishment of a positive Dick reaction. This reaction is probably the result of acquired hypersensitivity to the products of the streptococcus rather than of a natural susceptibility to a true toxin.

Public Health Reports, Washington, D. C.

61:1019-1058 (July 12) 1946

Treatment of Trypanosomiasis with p-Arsenosophenylbutyric Acid: I. Results in 319 Cases of Early Trypanosoma Gambiense Infections. H. Eagle.—p. 1019.

61:1059-1094 (July 19) 1946

Studies on Marihuana and Pyrahexyl Compound. E. G. Williams, C. K. Himmelsbach, A. Wikler and others.—p. 1059.
Complement Fixation Tests for American Trypanosomiasis in Texas. D. J. Davis and Thelma de Shazo Sullivan.—p. 1083.
Viability of Dried Bacterium Tularense. R. P. Miller.—p. 1084.

61:1095-1130 (July 26) 1946

Sickness Absenteeism Among Industrial Workers, Third and Fourth Quarters of 1945. W. M. Gafafer.—p. 1095.
Epidemic of Severe Pneumonitis in Bayou Region of Louisiana: VII. Histopathology in Laboratory Animals. G. L. Fite, C. L. Larson and B. J. Olson.—p. 1100.

Surgery, St. Louis

20:1-162 (July) 1946

*Technical Considerations in Surgical Therapy for Coarctation of Aorta. R. E. Gross.—p. 1.
Arteriovenous Fistulas and Arterial Aneurysms in Military Personnel. H. B. Shumacker Jr. and K. L. Carter.—p. 9.
Certain Aspects of Battle Wounds of Thoracic Cavity, with Special Reference to Method of Facilitating Reexpansion of Lung Following Late Decortication. J. Johnson.—p. 26.
Alterations of Blood Following Intrathoracic Operations: Clinical Study. L. B. Thomas, W. E. Adams and T. F. Thornton Jr.—p. 38.
Experimental Appendical Peritonitis: I. Prognostic Significance of Certain Hematologic Factors, Especially Prothrombin Time. J. H. Kay and J. S. Lockwood.—p. 56.
Neoplastic Biliary Obstruction: Improved Type of Radical Pancreaticoduodenectomy for Ampullary and Pancreatic Cancers. C. Dennis and R. L. Varco.—p. 72.
Experiences with Pauchet Technic of Colostomy Closure. G. B. Sanders and P. H. Halperin.—p. 82.
Treatment of Patients with Achalasia by Esophagogastrostomy. K. S. Grimson, R. J. Reeves, J. C. Trent and A. D. Wilson.—p. 94.
Treatment of Cardiospasm by Esophagogastrostomy. H. G. Bell.—p. 104.
*Transplantation of Toes for Fingers. F. Young.—p. 117.
Clinical and Experimental Observations on Use of Gelatin Sponge or Foam. H. P. Jenkins, R. Janda and J. Clarke.—p. 124.
Multicentric Origin of Intraoral Carcinoma. D. P. Slaughter.—p. 133.
Penicillin-Phthalylsulfathiazole Antagonism. E. J. Poth, R. I. Wise and Mary P. Slattery.—p. 147.
Differential Spinal Block: Preliminary Report. S. J. Sarnoff and Julia G. Arrowood.—p. 150.

Surgical Therapy for Coarctation of the Aorta.—Coarctation of the aorta is characterized by a narrowing or complete obstruction of the aorta at or near the ductus arteriosus or its obliterated remnant. Some persons with this abnormality survive for a surprisingly long time, but most of them have a life span which is far short of the normal expectancy. They may have (1) aneurysmal dilatation of the aorta, particularly above the constriction; (2) rupture of the aorta; (3) formation of a dissecting aneurysm; (4) superimposed Streptococcus viridans infection; (5) development of high blood pressure in the upper part of the body, with all the attendant dangers of the hypertensive state. Gross says that his observations in the experimental laboratory indicate that it is technically possible to remove a segment of the thoracic aorta and to reconstruct the vessel by end to end anastomosis. Five human patients have been operated on in the author's clinic for coarctation of the aorta; the first died of cardiac failure during operation, while the other 4 have made satisfactory recoveries.

Transplantation of Toes for Fingers.—Young describes a case in which it was necessary to amputate the left index finger of a woman aged 26 just proximal to the distal phalangeal joint. After the finger had returned to a fairly normal state, she was admitted to the hospital. The left knee was immobilized in acute flexion in a plaster cast. The circulation of the foot remained satisfactory, and four days later a body cast was applied to hold the left hip in acute flexion. The patient tolerated the position well, and four days later the stump of the left index finger was attached to the left second toe. The side of the case was padded with felt, and the arm was immobilized against it with elastic adhesive tape. The wound healed cleanly. The circulation of the toe remained completely normal. The patient tolerated the position well. Twenty-two days later the toe pedicle was divided, vessels were ligated and the wound was sutured. The circulation remained normal. One month after attachment the pedicle was completely severed. About eight months after completion of the transplant the finger was normal in color and the nail had already become more fingerlike. There was no active motion of the distal phalangeal joint. Sensation has returned to the level of the nail bed. The patient is able to localize light touch and pinprick correctly over this area and to differentiate hot and cold. Replacement of the thumb is best done by transplanting the great toe of the opposite foot; for finger restorations the second toe on the same side is most useful.

Texas State Journal of Medicine, Fort Worth

42:63-172 (June) 1946

Responsibility of State Medical Association with Regard to Postgraduate Medical Education in Texas. H. F. Connally.—p. 70.

42:173-250 (July) 1946

Surgical Treatment of Carcinoma of Pancreas and Ampulla of Vater: Analysis of 82 Cases. T. G. Orr.—p. 183.
Benadryl, Its Therapeutic Value in Allergy. R. Bowen.—p. 188.
Rh Factor: Analysis of Routine Rh Testing Service. J. M. Hill and S. Haberman.—p. 193.
Recent Advances in Rh Testing. S. Haberman and J. H. Hill.—p. 197.
*Penicillin in Treatment of Chronic Osteomyelitis. I. W. Kaplan and G. H. Bauer.—p. 202.
History of Psychiatry in Relation to Its Present Place in Medicine. T. H. Harris.—p. 205.

Penicillin in Chronic Osteomyelitis.—Kaplan and Bauer selected 58 cases of chronic bone infection for treatment with penicillin. Healing occurred in 18, but 6 of these reopened again within one month. Four of these 6 closed after another course of penicillin therapy. Twenty-three patients who did not respond to initial penicillin therapy were given 150,000 units of penicillin a day intramuscularly for one week followed by 90,000 units daily for another week. In 7 cases in which sequestrums were not present, healing occurred under this regimen. Twenty cases that failed to heal under penicillin therapy were selected for sequestrectomies. Ten healed within four weeks and 3 others healed within six weeks. All patients operated on received 150,000 units of penicillin intramuscularly daily several days before operation and postoperatively for a fourteen day period. Pyocyaneus was present in 16 of 21 cases that did not respond favorably to penicillin therapy and may well be one of the important causes for failure. Mechanical factors, such as fibrosis, sequestrums and bone sclerosis, all influence the efficacy of penicillin. Because of the decreased vascularity of the diseased area it is recommended that 240,000 units be given daily to increase the local concentration. The use of penicillin will not obviate the need for removal of sequestrums.

United States Naval Med. Bulletin, Washington, D. C.

46:977-1158 (July) 1946

Schistosomiasis and Its Control in Egypt. J. M. Amberson.—p. 977.
Dextrocardia with Situs Inversus: Report of 8 Cases, with Review of Literature on Dextrocardia. S. M. Caplan.—p. 1011.
Cancer in Naval Service. C. S. Cameron Jr.—p. 1017.
Clinical Problems of Amebiasis. A. M. Snell.—p. 1023.
Management of Common Eye, Ear, Nose and Throat Conditions in Naval Practice. H. J. Sternstein.—p. 1041.
Care of Paraplegic's Urinary Tract. M. H. Nourse and H. C. Bumpus.—p. 1053.
Emergency Surgical Measures Aboard an APA During Amphibious Invasion. M. G. Henry.—p. 1057.
Definite Surgical Treatment of Wounds of Colon and Rectum. G. A. Stevens, H. P. Sloan and W. A. Wickham.—p. 1069.
Prespondylolisthesis: Study of 23 Cases. P. E. McMaster and F. M. Dula.—p. 1077.
Alginate Impression Technic: Uses in Lower Denture Prosthesis. G. D. Mallory Jr.—p. 1083.
Insulin as Sedative in Treatment of Psychotic Patients in Tropical Hospital. R. A. Brunner and J. W. Owen.—p. 1088.
Ingrown Toenail: Simplified Operative Treatment. W. W. Mansell.—p. 1090.
Women Reserves for Overseas Duty. M. A. Berge and A. E. Rost.—p. 1100.

area where Anopheles gambiae and Anopheles funestus were vectors. The native population live mainly in the usual beehive type of hut, built of thatch overlying a framework of saplings, without windows and with only one small door. The interior of some of the huts is mud plastered to a height of 3 or 4 feet. The average hut is 12 feet in diameter, with a height at the apex of 8 to 9 feet. To obtain a reasonably effective covering film, a liberal dose of a 5 per cent DDT solution dissolved in commercial paraffin was applied to the interior of the huts, averaging 40 liquid ounces per hut. The insecticide was applied by means of a spray pump. The area selected for this experiment had been under systematic weekly insecticidal control in past years with a pyrethrum preparation. The results obtained indicate that the DDT solution offers a more economical and effective method of malaria control in the rural native areas than any other method of control so far attempted.

Schweizerische medizinische Wochenschrift, Basel

76:429-452 (May 18) 1946. **Partial Index**

Clinical Aspects and Therapy of Auricular Flutter. F. Wuhrmann and M. Rüede.—p. 429.
Role of Cholinergic Disequilibrium in Surgical and Traumatic Shock. E. Frommel and J. Piquet.—p. 432.
*Increased Incidence of Juvenile Hypertension. E. Attinger.—p. 435.
Occurrence, Action and Chemical Characteristics of Two Thyroid Hormones, Thermothyrin A and B. Anna Mansfeld.—p. 439.
Treatment of Scabies. P. Schwarz.—p. 444.

Increased Frequency of Juvenile Hypertension.—Attinger cites histories of 14 patients with juvenile hypertension and points out that for unknown reasons there is no parallelism between height and duration of blood pressure on the one hand and severity of cardiac, renal or ocular changes on the other hand. This factor makes thorough examination the more urgent. Special attention is directed to the reduction of the contraction amplitude as the only sign of a serious myocardial lesion and also to the changes in the QRS complex as an indication of disturbances in the intraventricular conduction. Condition and heredity play a part in juvenile hypertension, but the stress and strain of modern life also play a part. There is an increase not only in certain vascular but also in gastrointestinal disorders. It has been suggested that ulcer, gastritis or duodenitis, as well as coronary spasm or myocardial infarct, are all sequels of a primary vascular disturbance of vasomotor origin.

Minerva Medica, Naples

37:263-282 (April 14) 1946. **Partial Index**

*Ganglioneuroma of Lung: Case. G. Ceccarelli and A. Scarpa.—p. 263.

Ganglioneuroma of Lung.—Ceccarelli and Scarpa report that symptoms simulating those of pulmonary tuberculosis were exhibited by a woman aged 18. Pulmonary tumor was diagnosed on x-ray examination. The microscopic study of the tumor, surgically removed, revealed ganglioneuroma, which probably developed from paravertebral sympathetic ganglions. The patient has been in good health since the operation.

Revista Chilena de Pediatría, Santiago

17:223-294 (April) 1946

*Sepsis of the Newborn and of the First Half Year of Life. S. Costa.—p. 223.
*Pneumonia and Acute Glomerulonephritis in Children. J. Meneghello and H. Niemeyer.—p. 230.
Otorhinolaryngologic Disorders in School Children in Chile. A. Latorre Agüero.—p. 247.
Rh Factor and Blood Transfusion in Children. R. v. Dessauer K. and M. Schepeler V.—p. 255.

Sepsis During the First Half Year of Life.—Costa reviews observations on 17 infants hospitalized because of sepsis. The most frequent port of infection was the umbilical wound. Blood culture, done in 8 cases, was positive in 5 and negative in 3. Two of the 5 positive cases yielded Staphylococcus aureus and 3 hemolytic streptococcus. In the event of considerable dehydration, fluids were given by mouth and intravenously. Blood transfusions were given to those who had pronounced anemia. Sulfathiazole and sulfadiazine were the sulfonamides chiefly used. Penicillin was given to 8 of the 17 infants, and its efficacy is attested by the fact that all of those who survived had received penicillin and only 2 of those who were treated with penicillin died.

Pneumonia and Acute Glomerulonephritis in Children.—Meneghello and Niemeyer report the histories of 8 girls and 4 boys whose ages varied between 4 and 12 years. In all but 1 of the cases the renal process began almost simultaneously with the pneumonia. At hospitalization the children usually presented the pathognomonic symptoms of pneumonia and of glomerulonephritis. In half of the cases cardiac insufficiency developed. This high incidence of cardiac insufficiency is not mentioned in the previous literature. Drugs that counteract infections should always be employed, such as the sulfonamides or penicillin, even though the pneumonic process is not grave; penicillin is best. If hypertension is the predominating symptom of the renal condition, magnesium sulfate should be given. Cardiac insufficiency requires a venesection of from 100 to 300 cc., which should be followed by injection of from 10 to 20 cc. of hypertonic dextrose solution to which from 0.12 to 0.25 mg. of strophanthin or ouabain has been added. This injection should be repeated at intervals of from eight to twelve hours.

Acta Chirurgica Scandinavica, Stockholm

94:1-192 (June 15) 1946. **Partial Index**

Grave Ascending Cholangitis Following Cholangiography Carried Out Through Cystic Duct Infected with E. Coli: Clinical and Experimental Study. K. Mårtensson.—p. 1.
Diagnosis and Treatment of Tuberculosis of Ribs. H. Sjövall.—p. 33.
*Histologic Investigation of Resected Sympathetic Ganglions in 2 Surgical Cases of Thromboangiitis Obliterans, with Observations on Vascular Reactions. T. Skoog.—p. 49.
*Surgical Treatment of Idiopathic Megacolon (Hirschsprung's Disease). C. Van Gelderen.—p. 81.
Fertility in Operatively Treated and Untreated Cryptorchism. T. S. Hansen.—p. 117.
Paraxanthine Treatment of Hyperthyroidism. S. Borgström.—p. 137.
Clinical Experiences with Dextran as a Plasma Substitute. G. Bohmansson, H. Rosenkvist, G. Thorsén and O. Wilander.—p. 149.
New Method of Arthrodesis in Arthritis Deformans Coxae. A. Karlén.—p. 168.
Operative Treatment of Large Ventral Hernias with Metal Wire Netting. M. Felländer.—p. 171.

Sympathetic Ganglions in Thromboangiitis Obliterans.—Skoog employed lumbar sympathectomy in the treatment of 2 patients with thromboangiitis obliterans. The patients were men aged 47 and 46 with severe pains in the legs. Some improvement of the circulation resulted from prolonged conservative treatment in both cases, but the pain was not alleviated and gangrene threatened to spread in the second case. Sympathectomy gave immediate relief to both patients through an increase in the circulation, which still persisted half a year after the surgical intervention. This was manifested by a pronounced rise of temperature in the legs and by their normal color. Microscopic examination of the resected ganglions revealed a normal morphology. The extensive pathologic changes observed by Sunder-Plassmann in the sympathetic ganglions could not be verified in spite of extremely successful staining of the ganglionic tissue. Thromboangiitis is usually associated with a considerable vasospasm, probably released by reflexes. When the vascular changes have progressed too far, the walls of the vessels stiffen and the spastic component of vascular constriction disappears; in such cases nothing can be gained from sympathectomy, which eliminates the spasm caused by the disease in the vessels.

Surgical Treatment of Idiopathic Megacolon.—A youth aged 19 and a boy aged 12 years were treated for Hirschsprung's disease. Extensive sympathectomy with use of Adson's method, including resection of both lumbar trunks, was performed in both cases, with wide resection of the superior hypogastric plexus in the first case. Before operation, enemas and laxatives were given. Functional examination of the colon (roentgenography of the colon, segmental spinal anesthesia and administration of parasympathicomimetics, such as carbaminoylcholine chloride or neostigmine) is required to demonstrate whether the hypertrophic muscular wall will allow for compensation when it is freed from pathologic innervation. Good results were obtained in both cases, with substantial improvement in the first and complete recovery in the second case. There were no untoward reactions, but loss of ejaculation is to be expected in the first case.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

69:1-72 (March) 1946

Somatic Receiving Area in Brain of Shetland Pony. E. D. Adrian. —p. 1.
Clinical Signs of Meningeal Irritation. J. E. A. O'Connell.—p. 9.
Development of Substantia Nigra. E. R. A. Cooper.—p. 22.
Development of Human Red Nucleus and Corpus Striatum. E. R. A. Cooper.—p. 34.
Accessory Optic Tracts in Human Fetus. E. R. A. Cooper.—p. 45.
Development of Nuclei of Oculomotor and Trochlear Nerves (Somatic Efferent Column). E. R. A. Cooper.—p. 50.
Neurology and Psychiatry: Their Common Problems. A. Paterson. —p. 58.

British Medical Journal, London

1:977-1010 (June 29) 1946

Typhus: Experiences in Central Mediterranean Force. H. D. Chalke. —p. 977.
Duodenal Ulceration: Gastroscopic Study of Gastric Mucosa and Its Surgical Significance. H. Freeman.—p. 980.
Theory and Nomenclature of Rh Types, Subtypes and Genotypes. A. S. Wiener.—p. 982.
*Rh Factor and Hepatomegaly and Splenomegaly in Children and Adolescents. R. J. Drummond and A. G. Watkins.—p. 984.
Tuberculosis in Service Men: Preliminary Report. H. C. Mukerji. —p. 987.

Rh Factor and Hepatomegaly and Splenomegaly.—Drummond and Watkins say that infants with congenital hemolytic disease may sustain damage to liver or spleen or both as manifested by jaundice and hepatomegaly, or splenomegaly, during early infancy. They decided to apply Rh factor investigations in families in which there were children or adolescents with enlargement of the liver or spleen. Three families were investigated. Since previous rhesus immunization of the mothers was clearly proved in the first and second families it is possible that the hepatomegaly and splenomegaly in these children is a late manifestation of damage caused by the noxious action of Rh isoantibodies. If damage by Rh isoantibodies was the cause of the liver and splenic enlargement in the children of the first and second families it becomes intriguing to know why in the first family the second, fourth and seventh children, who were all Rh positive, did not have jaundice, hepatomegaly or splenomegaly, whereas the sixth infant died jaundiced and the eighth had a moderate degree of jaundice but recovered spontaneously. The Rh-negative child in the first family has always been normal. That the first child in the second family was not affected, although Rh positive, is understandable, for it is known that in hemolytic disease the firstborn is frequently unaffected. However, since rhesus immunization of the mothers was proved in the first two families, it seems likely that congenital hemolytic disease was the cause of the liver and splenic enlargement. The children with splenomegaly and hepatomegaly in the first two families are unusual in that jaundice apparently never occurred. Some infants affected with congenital hemolytic disease may be profoundly anemic though never jaundiced. In the third family the affected child was jaundiced for several weeks, but the possibility of rhesus immunization of the mother was excluded. The authors think that Rh factor investigations should be applied also in cases diagnosed clinically as Banti's disease or splenic anemia in children.

Medical Journal of Australia, Sydney

1:825-860 (June 15) 1946

Notes on Treatment of Pulmonary Tuberculosis. C. J. O. Brown. —p. 825.
Recent Experiences in Canada and United States. H. M. James. —p. 827.
Psychotic Casualties in New Guinea, with Special Reference to Use of Convulsive Therapy in Forward Areas. D. Ross.—p. 830.
*Congenital Fibrocystic Disease of Pancreas. P. E. Blaubaum.—p. 833.
Backache in Soldiers. D. Stuckey.—p. 838.
Blood Loss in Cesarean Section. L. Benson.—p. 842.
Chronic Vesiculitis as Factor in Production on Nongonococcal Urethral Discharges. C. E. Marshall.—p. 846.

Congenital Fibrocystic Disease of Pancreas—According to Blaubaum congenital fibrocystic disease of the pancreas is distinguished by congenital and severe atrophic changes in the secretory powers of the pancreas. The onset is always before twelve months, whereas celiac disease is commonly regarded as commencing after the first twelve months of life. The onset may be pulmonary, gastrointestinal or the two together. The child is emaciated, often despite a healthy appetite. The abdomen is protuberant and tympanitic, and the extremities are spindle-like. The liver is often enlarged, in contrast to the small liver of celiac disease. Examination of the chest reveals poor movement, often a hyperresonant percussion note with diminution of the superficial cardiac dulness, and liver dulness. The course of the disease is short, death usually occurring before the age of 12 months, although a few reach the age of 3 or 4 years. Fibrocystic disease of the pancreas may be suspected in cases in which the disorder is of atypical celiac type with a high percentage of fat in the stools and when pulmonary symptoms are also present, especially if pulmonary or gastrointestinal troubles date from early infancy. The final proof lies in duodenal aspiration and direct estimation of the enzyme content of the pancreatic secretion. A method of diagnosis by duodenal intubation and aspiration of duodenal contents with estimation of tryptic activity is described. The clinical data and postmortem findings with regard to 2 children are reported. Treatment consists in controlling the intermittent exacerbations of respiratory infection and in the replacement of vitamin and enzyme deficiencies. The use of pancreatic extract, enteric coated, given ten minutes before a feeding, combined with the intramuscular injection of large doses of vitamin A, is effective in prolonging life from a few months to a year or two.

1:861-896 (June 22) 1946

The Rh Blood Types and Their Reactions. J. J. Graydon and R. T. Simmons.—p. 861.
Early Diagnosis in Tumors of Central Nervous System. W. L. Reid. —p. 865.
Studies in Nicotinic Acid. R. W. Hawker.—p. 872.
Acceptable Words: Quotations with Medical Bearing. J. B. Cleland. —p. 876.
Method for Removal of Tonsils and Adenoids Under Local Anesthesia with Patient in Recumbent Position. R. H. Bettington.—p. 882.

1:897-932 (June 29) 1946

Studies on Rh Isoimmunization. N. R. Henry and R. T. Simmons. —p. 897.
Results of Penicillin Therapy in Treatment of Gonorrhea. Stefania W. Siedlecky.—p. 904.
Rehabilitation of War Neurotics. C. M. McCarthy.—p. 910.
Rehabilitation of War Neurotics. H. H. Willis.—p. 912.
*Detection of Cysts of Endameba Histolytica in Feces by Microscopic Examination. A. T. H. Marsden.—p. 915.

Detection of Endameba Histolytica in Feces.—Marsden says that the diagnosis of a chronic infection with Endameba histolytica by microscopic examination of the feces for the presence of cysts depends for its success or failure on the number of cysts passed and on the frequency with which they are excreted. There is no way of detecting all chronic amebic infections by stool examinations. Stool examinations should not be made on consecutive days, because most cyst passers excrete their cysts for only a few days at a time and at random intervals. Stool examinations on only two or three consecutive days do not give a true picture. Four stool examinations at intervals of one week are recommended as being the most efficient. Examination of more than one preparation from the same stool increases the chance of detection so little as not to be worth while.

South African Medical Journal, Cape Town

20:361-396 (July 13) 1946

Sympathicus, Hyperthyroidism, Basedow Disease: Their Treatment and Control by Thiouracil. C. F. van der Merwe.—p. 362.
*Malaria Control in Rural Native Areas by Using DDT Insecticide. F. W. P. Cluver.—p. 368.
Unilateral Dysmenorrhea Associated with Uterine Malformation. L. Resnick.—p. 370.
Chemical Thyroidectomy. L. P. Bosman.—p. 373.
Effect of Tubercle Endotoxoid in Pulmonary Tuberculosis. P. L. Salinger.—p. 375.

Malaria Control in Rural Native Areas by DDT.—To ascertain the possibilities of the use of liquid DDT for the control of malaria in the rural native areas of Zululand and to compute comparative costs with a pyrethrum base insecticide, an experiment was inaugurated in an endemic malaria

Book Notices

Nomenclature of Pathogenic and Parasitic Organisms. Paper. Pp. 66. Hartford, Connecticut: Connecticut State Department of Health, 1945.

Few matters are more vexing than the classification of the pathogenic micro-organisms, especially the bacteria. While this state of affairs is a result primarily of ignorance, e. g. in most instances there is insufficient knowledge to allow the development of a taxonomy based on phylogeny, it is also true that much of the confusion is man made. The Bergey Manual, for example, which in this country assumes a mantle of authority, is freely revised every few years with the creation of new names and shifting of bacteria from one genus to another. If an attempt is made in teaching to follow this shifting pattern, the medical student, having had bacteriology in the first or second year, frequently finds that a new set of names is "official" by the time he has completed his residency.

This booklet, compiled by E. K. Borman of the Connecticut State Department of Health, is an admirable attempt to provide the physician, health officer and clinical laboratory worker with a list of the common names and synonyms of the more important infectious agents but is in no sense a guide to the etiology of infectious disease. The entire range of pathogenic micro-organisms is covered in eight sections, on bacteria, Rickettsiae, fungi, parasitic protozoa, trematodes, cestodes, nematodes and miscellaneous helminths. The bacterial nomenclature is taken almost entirely from the fifth edition of the Bergey Manual, and the author states in the preface that "that manual is now in the process of revision so that some of the names given herein may be superseded by others as soon as the sixth edition of the manual is in print." The classification of the Rickettsiae is handled well and that of the fungi is based on Dodge for the most part. The nomenclature of the larger parasites is relatively stable and is given here in the usual way.

A number of minor criticisms may be made. For example, it is generally felt that differences among strains of Erysipelothrix are insufficient to justify a differentiation on species basis of the micro-organism causing erysipeloid in man and erysipelas of swine. The genus Leptospira is defined on a morphologic basis, to which Spirillum minus hardly conforms. The genus Paracolobactrum to include the as yet undefined species of "paracolon" bacilli seems hardly necessary, and question may be raised with regard to Salmonella kauffmannii as a repository for Salmonella types when immunologic typing of these forms is becoming increasingly valuable in epidemiologic studies. The question of streptococci is handled particularly well in that there are but two subdivisions, the beta hemolytic form and the alpha hemolytic form, but it would have been desirable to indicate the immunologic typing of the former group. The name Cryptococcus histolytica has been retained, though ascospore formation was demonstrated by Todd and Herrmann in 1936 and the organism is referred to the genus Debaryomyces with the proper specific name of Debaryomyces neoformans. The generic name Candida is now commonly and properly used for the "medical monilias," but forms are referred to here as species of Syringospora. The misnomer Streptobacillus moniliformis is retained for the fungus of rat bite fever instead of the more accurate Actinomyces muris-ratti.

These are, however, minor points and do not detract appreciably from the value of this booklet. A complete index, covering all names and synonyms, adds greatly to its usefulness.

Preoperative and Postoperative Treatment. Edited by Lt. Col. Robert L. Mason, M. C., A. U. S., and Harold A. Zintel, M.D. Second edition. Cloth. Price, $7. Pp. 584, with 157 illustrations. Philadelphia & London: W. B. Saunders Company 1946.

Most books on preoperative and postoperative care are really manuals containing specific details as to what to do and how much to give, resembling the cookbook point of view and leaning heavily on past practices. As a result, tradition is maintained even to the point of repeating details from textbook to textbook long after the procedure has become outmoded or found useless or even dangerous. For example, many years went by before the preoperative purge with castor oil was condemned instead of recommended. One wonders how long it will take before routine gastric lavage will be accepted as a means of emptying the stomach rather than washing it endlessly with large volumes of sodium bicarbonate solution.

The present work reflects a rather uneven attitude toward tradition. Because twenty different authors have written the thirty-three chapters, considerable variation is inevitable. For example, several chapters contain valuable and recent first hand data, such as the chapter reporting a study of postoperative pulmonary complications. The several chapters devoted to problems of nutritional care and fluid balance have covered the subject in a modern manner. By contrast, the discussion on surgical shock reflects little of the stimulus given the subject by recent studies on the crush syndrome and on the influence of damaged tissue in producing circulatory impairment. Early ambulation, which has received considerable recent study, is discussed formally in a noncommittal way in less than one page of text. Apparently this procedure is not used by the authors of this chapter, yet early termination of rest in bed is highly recommended in another chapter on venous thrombosis written by another author as an effective means of preventing this complication. The recommendation of the use of heat in the treatment of shock is supported by tradition but is certainly contrary to most present evidence. Advocacy of the routine postoperative use of drugs to stimulate intestinal musculature would probably arouse considerable opposition from many surgeons. It is surprising to see the triple dye treatment for burns described and recommended in spite of the fact that simple dressings are now almost universally used, based considerably on the studies and experiences during the war. An illustration showing blood drawn from a donor into an open vessel looks antiquated at the present time when the closed system for the preparation and administration of intravenous fluids has been almost universally adopted as a means of preventing air contamination.

One important factor in surgical care, emphasized during the war experience, has received scant consideration in the present work. This factor concerns the influence of psychogenic disturbances, particularly during the postoperative period. Perhaps it is a little too early to expect recent procedures or points of view to be included in a textbook. Perhaps they will be given sufficient attention in subsequent editions. There seems to be a great need for a book of this type, particularly for the guidance of younger surgeons on whose shoulders the nonoperative care of the surgical patient so frequently falls. In spite of the foregoing comments, the present textbook represents a step in the right direction by attempting to place principles ahead of details so that the young surgeon may understand reasons rather than memorize procedures. Each chapter is documented with an ample bibliography.

A Manual of Tuberculosis: Clinical and Administrative. By E. Ashworth Underwood, M.A., B.Sc., M.D., Medical Officer of Health, County Borough of West Ham. With an introduction by Professor J. R. Currie, M.A., M.D., F.R.C.P. Third edition of "A Manual of Tuberculosis for Nurses and Public Health Workers." Cloth. Price, $4.50. Pp. 524, with 88 illustrations. Baltimore: William Wood & Company, 1945.

The third edition of this handbook appears in attractive format and readable type. The text has been revised, some sections have been rewritten and a number of chapters have been added, thus bringing the work up to date except for the present experimental investigation in the field of chemotherapy and its clinical trial in human beings suffering from tuberculosis. It is remarkably comprehensive and yet reasonably compact. That the author has taken into consideration the varied manifestations of tuberculosis in all parts of the body is obvious, and of equal importance is the fact that he has considered its significance from the individual, collective and community point of view. In some chapters he devotes too much space to the opinions of various authorities and too little to his own convictions. This is particularly true of his discussions of classification and therapy. American students will wonder why Trudeau is not mentioned with Boddington, Brehmer and Walther in the historical sketch of institutional treatment; also why in the discussion of classification there is no reference to the classification of the National Tuberculosis Association as presented in "Diagnostic Standards." On the whole this edition will serve as a valuable reference and guide for the general practitioner, the nurse and the medical student. Certain chapters will be helpful to adminis-